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ON SOME PREPARATIONS OF ASSAFŒTIDA.

By J. B. Moore.

In many nervous affections, both in adults and children, there is perhaps no remedy in the materia medica more potent or valuable than assafœtida, and no medicine would be more frequently prescribed by physicians, were it not for its extremely repulsive odor and taste. These qualities alone deprive this invaluable old remedy of its popularity and usefulness to a very great extent. It is now being occasionally prescribed by a few of our best physicians, both alone and in conjunction with other medicines, in the form of suppository, and, I understand, with very satisfactory results. If prepared from *pure* and *fresh* tears, I cannot see why it would not exert its therapeutic effects upon the system when administered in this form, as well as many other remedies which have been proved by experience to manifest their full effects when administered in this way. It would certainly be a very convenient and desirable form in which to employ this excellent but offensive remedy, when it cannot be taken by the stomach. To test the excitant and anti-spasmodic power of this medicinal agent in suppository should, I think, claim the attention of medical men, as there are many cases of nervous diseases, hysteria, &c., in which it is so highly useful, and there are some persons to whom it seems to be so peculiarly adapted, that no other remedy can be satisfactorily substituted; and yet the sensitive and fastidious palate of the patient will not tolerate its use. I believe it will be found, when employed in

this form, in the *proper* dose, to be almost equally efficient as when given in the usual forms by the stomach. I have experienced upon myself strongly marked excitant effects of the volatile oil, in a very short time after a suppository of the drug had been introduced, and which continued for a considerable length of time. To derive satisfactory results from its employment, however, in this form, it is absolutely necessary that the suppositories should be prepared with care from *pure, fresh tears*, and not from the partially inert drug in powder.

Suppositories of assafœtida are very difficult to prepare, owing to the *resin* of the fresh drug not being miscible with melted butter of cacao. This has proved an almost insuperable obstacle to their successful manufacture. Assafœtida has proved more intractable in my hands than any other substance of which I have attempted to make suppositories. It being utterly impossible by any of the usual means to retain it in intimate mixture with the cacao butter, in the liquid state, long enough to pour into the moulds, the resinous portion would separate and obstinately adhere to the bottom of the vessel, notwithstanding the most careful and varied manipulation.

To remedy this difficulty and source of trouble and annoyance, I instituted a series of experiments, and tried various means, without avail, until it finally occurred to me that if I would saponify the resin and volatile oil with an alkali, that it would promote the solubility of the resin, and render it miscible with the melted fat. I selected liq. potassæ as the most eligible and convenient for the purpose, and employed it in the proportion of one drop to about eight grains of the drug, with complete success.

When *perfectly pure tears* can be procured, they may be thoroughly malaxated in a mortar until perfectly smooth, and the liq. potassæ then dropped in and well incorporated, and the whole afterwards well rubbed with the butter of cacao, and suppositories prepared in the usual manner. But as it is important that suppositories should contain nothing in their composition which would be likely to create irritation, and as assafœtida is so generally contaminated with impurities that it is almost impossible to obtain tears in sufficient quantity, perfectly free from

foreign matter, suitable for their preparation, therefore, in order to make their manufacture easy and a perfect success, it is necessary that there should be some means proposed to purify it, and bring it to a suitable condition for the purpose. To accomplish this object, after repeated experiments, the writer has adopted the following plan, which will free the drug from all coarse foreign particles which would be likely to prove objectionable:

℞. Assafœtidæ, (carefully selected tears,) ℥j.
Alcohol, sp. gr. ·809, f℥iv.

Cut the assafœtida into small pieces, and rub it in a mortar until reduced to a *smooth* paste. In cold weather, to facilitate this operation, a few drops of the alcohol may be added, as found necessary; then add the remainder of the menstruum in small portions at a time, with constant rubbing, until a smooth and uniform mixture is attained, which must be strained through muslin into a shallow vessel with a good evaporating surface. Then set it aside in a place favorable to evaporation, and allow it to evaporate spontaneously, with occasional stirring, to about the consistence of *thick* honey. This should be immediately transferred to a tightly covered jar, and labelled "purified assafœtida," and preserved for use. When kept a long time, it should be well stirred with a spatula before being used. When prepared in large quantity, it should be put up in ounce jars, kept in a cool place, and the air excluded as much as possible.

To prepare assafœtida suppositories of medium strength:

℞. Assafœtidæ purificatæ, ʒiij.
Liquoris potassæ, gttxxij.
Ol. theobromæ, ʒv.

Rub the liq. potassæ in a mortar with the purified assafœtida, until well and smoothly mixed, then gradually add the butter of cacao in small portions at a time, and incorporate thoroughly, until about one-half is added; then add the remainder, which may not be so carefully mixed; then proceed to prepare one dozen suppositories in accordance with directions given in the writer's essay upon suppositories, on page 225 in May number of the Journal of Pharmacy. They should be cast in moulds of 35 grs. (cacao butter) capacity.

As thus prepared, *each* of these suppositories contains, when the whole process has been carefully and skilfully managed, the *entire* active properties of *fifteen* grains of assafœtida, and are beautiful and elegant in appearance. Suppositories of almost any desired strength, from one to twenty five or thirty grains, can be made, with the greatest facility, by the above process. The above, however, is about the strength usually prescribed by physicians for adults.

The use of liq. potassæ in the foregoing process I consider entirely unobjectionable, as it is in too minute a quantity to produce the slightest irritation, and being wholly saponified; if not entirely so by the resin and volatile oil, it is by the fatty acids of the butter of cacao. I should think its tendency would be beneficial, rather than otherwise, by increasing the solubility of the resin, and rendering it more easy of absorption; consequently promoting the activity of the drug.

As far as I can learn, druggists generally who have a demand for suppositories of assafœtida are in the habit of preparing them from the powdered drug, to avoid the trouble encountered in using the fresh tears. Powdered assafœtida must be almost, if not entirely inert, when administered in this form, being nearly, if not quite devoid of volatile oil, and the resin in a state unfavorable to absorption.

Mistura Assafœtidæ.—Purified assafœtida, asabove prepared, will be found not only convenient for making suppositories, but also for preparing, extemporaneously, the milk of assafœtida, which can be made of any desired strength, from 15 grains, U. S. P., to 30, 40, or even as much as 120 grains to the fluid-ounce, with it in a few minutes, with but little labor, compared with the tedious and frequently unsatisfactory process when the crude drug is used.

Enema Assafœtidæ.—Assafœtida, when purified as directed above, is greatly preferable to the tincture ordered in the British formula for this preparation. By its use the objectionable admixture of alcohol is avoided in the preparation. When made with it, about forty-one or forty-two grains should be substituted for the six fluidrachms of the tincture ordered, which represents about the assafœtida strength of the latter. In preparing the

enema, the purified assafœtida should be well rubbed up with the mucilage of starch of the formula, or first with a small portion of water, as in making lac assafœtida, and then with the mucilage gradually added, allowing, if thought necessary, for the water added.

Pil. Aloes et Assafœtidæ, and Pil. Galbani Comp.—The purified assafœtida can be substituted with convenience and advantage, for the crude drug, in the officinal formulæ for the preparation of the above pills. It is usually of such consistence that it forms a convenient pill mass with the other ingredients, without the use of any other excipient.

It may be advantageously substituted for the crude drug, also in the preparation of all pills in extemporaneous prescriptions, when the latter is among the ingredients prescribed, provided the ingredients with which it is associated are in a dry or powdered condition. Purified assafœtida in such cases will not only serve as a substitute for the crude drug, but frequently as an excipient.

Philadelphia, August, 1868.

NOTE ON A FALSE JALAP.

By William Procter, Jr.

A few weeks since the writer was called upon by two Mexican gentlemen, in relation to a sample of dried tuberous roots about which they desired information. They stated that the tubers were dug on property belonging to one of them. The manner of its discovery was in this wise: Certain itinerant root gatherers had been operating on these lands without permission, and under the impression that the roots were valuable they were detained. The idea appeared to be that they were jalap tubers, and the object of the visit was really to determine this point. The specimens consisted of half a dozen tubers, several of which were perfect. The largest was six inches long, two wide, and from half an inch to an inch thick. Its shape was almost precisely that of a castor sack, wrinkled and flattened just as castor is often seen. Other tubers were three inches long, and as wide and thick as the large tuber, but varying in shape, which, from

the fleshy nature of the root, is modified in drying. The epidermis is exceedingly wrinkled, and has a mottled brown color resembling jalap, varying from light brown to almost black. The odor of the tubers is almost precisely that of true jalap, and very decided, and this character renders it a dangerous adulteration, as it is more difficult to imitate the odor of jalap than any other of its properties. The tubers are not scored with a knife, like jalap often is, to facilitate drying. The interior is spongy in texture, no indications of concentric tissues, as in jalap, and no visible resinous deposit. It is easily impressed with the nail, and has a tolerably uniform light drab-brown color. Desiring to know more of its structure and botanical characters, I submitted a sample to Prof. John M. Maisch for microscopic examination, who kindly makes the following report:

"The surface is composed of suberous layer in about ten rows of cells, the walls of which are partly dark brown and partly brownish-yellow. The parenchyma of the bark, which occupies five to six times the thickness of the former layer, consists of numerous cells stretched tangentially, and is not interspersed with medullary rays. Inside the cambium line we find the parenchyma composed of more regular cells, and containing vessels surrounded by soft ligneous prosenchyma, the bundles showing upon cross section very short, bent, or somewhat irregularly twisted lines, which are scarcely concentrically arranged, and without any distinct or very apparent radiating arrangement. The parenchyma of the bark and body of the tuber contains much starch, but no resin cells, nor have I yet found crystals in either tissue.

"The structure of the tuber is therefore very different from that of the so-called 'jalap stalks,' the tubers of *Ipomœa Orizabensis*, which have a distinctly radiating arrangement of the ligneous bundles. It differs from true jalap in the total absence of the resinous zones and cells; but if these are left out of consideration there is a striking resemblance between this false jalap and the true tuber, as the simultaneous examination of sections of both will show. The false jalap in question has no similarity whatever with the roots and tubers which have been

named as occasional adulterations of true jalap, such as Mirabilis jalapa (*Radix metalistæ*), Asclepias, and Bryonia.

"For the above reasons I am of the opinion that the origin of this tuber, which might be called *mealy jalap*, comes from a convolvulaceous plant, probably nearly related to the true jalap plant.

"Some eight years ago a jalap was imported into New York, which, as far as I can remember, agrees in structure with the specimen now before me; but the former cannot at present be examined. I remember, however, that at the time of its importation it was supposed to be true jalap deprived of its resin, whilst an examination made by me, of which I kept no record, showed the absence of resin cells, but a general agreement in structure with true jalap. I am satisfied that the false tuber now shown is not new in our market.

"Yours, truly, JOHN M. MAISCH."

The tubers, from their shrivelled appearance, may have been collected at the wrong season, and, as it is well known in the case of sanguinaria, podophyllum, etc., the proximate constitution of such samples is very much altered from that of the drug collected in the autumn.

One hundred grains of the tuber were reduced by bruising and cutting sufficiently fine to be extracted by alcohol, 95 per cent., to which it yielded 22 per cent. of its weight. The alcoholic extract possessed the jalap odor of the root very decidedly. The tincture affording it had a decided acid reaction, a brown color, and the odor of the root. The alcoholic extract was then treated with ether by repeated malaxations, until it was exhausted. The ethereal tincture of the extract was brown-colored, had a decided acid reaction, and on evaporation afforded two grains of a soft extract, strongly odorous of jalap, with a decided acid reaction. The residue, undissolved by ether, when treated with water was largely dissolved, leaving a brownish pulverulent residue undissolved, weighing two grains, which was soluble in liquor potassæ with heat, and not precipitated by hydrochloric acid. The watery washings of the alcoholic extract, after treatment by ether, were dark brown colored, and contained the larger part of the matter, extracted by alcohol from the root. When boiled

with an alkaline solution of oxide of copper, the latter was reduced at once, indicating the presence of glucose. The residue of the tubers, after the alcoholic treatment, when macerated in cold water and then boiled, afforded a decoction charged with starch.

The investigation was not pushed further; sufficient is shown to prove that this false jalap has a different constitution from true jalap in the absence of a large proportion of resin, but that it contains sufficient of the ingredients of jalap to indicate a probable botanical relationship with that tuber.

In regard to the exact locality whence these tubers came, the parties seemed indisposed to speak, except that it was in the northern part of Eastern Mexico; nor did they know anything of the character of the plant.

Philad., Aug. 29, 1868.

GLEANINGS FROM GERMAN JOURNALS.

By Prof. John M. Maisch.

Assafœtida.—Ed. Schær has met with assafœtida lumps of the size of a fist to that of a head, consisting almost exclusively of the same white mass found in the tears; the softer crummy mass was reduced to a very small proportion, and the whole was pretty free from earth, sand and fragments of plants. But on close examination stones were found to be imbedded in the white mass, closely resembling the latter in color, and evidently added to the juice before it was hard. The stones, some of which weighed 8 oz., one even 12 oz., consisted mainly of carbonate of lime, containing some magnesia, ferrous oxide and silicic acid, and resembled calcareous spar or dolomite in structure.—(*Schweizerische Wochenschrift f. Pharm.* 1868, 9, 10.)

Iodide of Nitrogen is formed without danger of explosion if the ammonia contains a minute quantity of oil of cloves, (one drop to 2 oz.); the transformation into iodide of ammonium takes place almost instantaneously at a temperature of 15° R. (66°F). Glycerin appears to act in the same way. (*Ibid.*, 28.)

Irish Moss.—Dr. F. A. Flückiger and L. Obermaier found it to contain about 1 per cent. nitrogen and to yield 15·6 per cent.

ashes. The mucilage prepared by digesting the Irish Moss in the steam bath for a day, precipitating the decoction with alcohol and purifiying the precipitate twice from its aqueous solution with alcohol, was a horn-like mass of a light brownish tint, difficult to powder, and contained ·88 per cent. of nitrogen and yielded 15·9 per cent. ashes, containing notable quantities of sulphates. The mucilage readily swells in water and dissolves to a nearly clear liquid without action on litmus; the solution is not precipitated by ferric chloride or silicate of soda, but sugar of lead causes a precipitate, the filtrate from which is not rendered turbid by alcohol. It is not dissolved by cuprammonia, and moistened with sulphuric acid not colored blue by iodine. Boiled with nitric acid, it yields mucic acid. It differs, therefore, essentially from cellulose, starch and gum, but is a true mucilage, nearest related perhaps to the mucilage of marshmallow root.

The agar-agar or tjentjan of the Chinese and Japanese, is the very pure mucilage of Sphærococcus tenax, *Agardh*, and behaves in some respects like the former.—(*Ibid.*, 85–88.)

Spiritus Ætheris Chlorati.—Ed. Schær recommends the following process: 1½ parts powdered bichromate of potassa is mixed with 8 parts common muriatic acid sp. gr. 1·17, and introduced into a retort; 32 parts of alcohol, sp. gr. 837 to 840, are added, with the precaution to prevent its becoming mixed with the acid, in order to avoid the formation of aldehyde and other products of oxidation. A uniform heat is applied by means of a sand- or water-bath, and 28 parts are obtained by distillation, which, if necessary, are rectified over calcined magnesia.—(*Ibid.*, 94.)

Euphorbon.—This name is given by Dr. Flückiger to a constituent of euphorbium, which is related to lactucon. It is soluble in ether, benzin, amylic alcohol, chloroform, acetone and glacial acetic acid. From the solution in the first two solvents it effloresces, on spontaneous evaporation, in feathery needles, from the chloroformic solution containing alcohol in short prisms showing double refraction under the polariscope. It is readily soluble in boiling alcohol, fusible above 106°C (223°F.), indifferent to litmus and unaffected by most acids and alkalies.

If dissolved in concentrated sulphuric acid and the solution spread out upon a porcelain plate, it is colored violet by nitric acid of about the sp. gr. 1·2. Lactucon and colchicin show the same coloration. But the acid solution of the latter diluted with water, assumes a beautiful yellow red color with a violet tinge by potassa, while euphorbon is precipitated from its acid solution by water without change of color. Elementary analysis led to the formula $C_{26}H_{22}O_2$. Johnston's uncrystallizable indifferent resin, which is very readily soluble in cold 75 per cent. alcohol, has the composition $C_{26}H_{22}O_4$. Euphorbium contains about 38 per cent. resin (acrid principle), 22 euphorbon, 18 gum, 12 malates and 10 per cent. inorganic matter.—(*Ibid.*, 94–96.)

Reaction of Oxide of Copper with Guaiac.—Pagenstecher observed, about 30 years ago, that a cupric salt in the presence of hydrocyanic acid imparts a blue color to guaiac resin. Ed. Schær found that a liquid containing $\frac{1}{3000}$ per cent. of sulphate of copper and $\frac{1}{8000}$ per cent. shows the reaction very distinctly, and argues that this is produced through a portion of the oxygen of the cupric oxide present in the modification of ozone, which in the presence of hydrocyanic acid, is induced to react with the resin of guaiac. The reaction with the same resin of binoxide of lead, ferric and mercuric oxide depend likewise upon the presence of active oxygen.—(*Ibid.*, 18 and 19.)

Traces of Ammonia are detected by Bohlig's reagent (mercuric chloride with the addition of carbonate of potassa) or by Nessler's reagent (mercuric iodide dissolved in iodide of potassium with the addition of potassa). Rehsteiner found that the former produces, in 5 minutes, a distinct white turbidity in liquids containing one millionth part of ammonia, while the limits of the latter reagent are $\frac{1}{3000000}$, producing in 15 minutes a faint yellow turbidity.—(*Ibid.*, 112).

GLEANINGS CHEMICAL AND PHARMACEUTICAL.

By the Editor.

Vegetable organisms in the human blood.—Dr. Joseph G. Richardson, of Union Springs, N. Y., after numerous examinations of human blood, has arrived at the conclusion that living organ-

isms in decomposing beef tea, when ingested, may enter the circulation and increase there; and bases his belief on experiments made on himself, by microscopical examination of his blood at intervals after taking four ounces of beef liquid which, according to calculation, contained 27,000,000,000 of living organisms. Dr. R. thinks the presumption is strong that other plants besides those noticed by himself, of a more poisonous nature, may thus enter the circulation, "and each constitute the essence, the real *contagium*, of some so-called zymotic disease, as, for example, diphtheria, and scarlet fever, small-pox and measles, as declared long ago by Prof. Salisbury, of Cleveland, and recently by Prof. Hallier, of Jena."—*Amer. Journ. of Med. Sciences*, July, 1868.

Whey as food for infants.—Mr. Geo. S. Dickey, pharmaceutist of San Francisco, in a communication directed to physicians in the Evening Bulletin of that city for July 3d, calls attention, in those cases where young infants cannot have their natural food, to the advantages to be gained by the use of sweet whey, obtained from cows' milk. "By simply warming, adding a small quantity of 'liquid rennet,' and setting aside in a warm place for a while, will separate the casein (curd) from milk. The whey, separated from the curd by straining, is the most nutritious and digestible food for the tender infant, varied by the gradual addition thereto of unchanged milk."

On the comparative action of various disinfecting agents.—Dr. Beranger-Feraud, of the French navy, after trying wood charcoal, chlorine, chloride of lime, carbolic acid, and protosulphate of iron in deodorizing the bilge water of ships, comes to the conclusion that permanganate of potassa far exceeds them all in rapidity of action and thoroughness of effect, and says: "I made use of a solution of permanganate of potash, of the strength of half an ounce of crystals to a quart of water. One ounce and a half of this solution, which has a fine crimson color, added to a pint of foul bilge water, effectually removed all bad odor in three minutes, with a change of color to a dirty grayish-brown.

"The purifying action of permanganate of potassa is so remarkable that its success in the disinfection of putrid matters of every kind may safely be assumed. I have derived the greatest advantage from its use for many other sanitary purposes besides

those just mentioned. It not only effectually destroys the foul odors arising from suppurations, and from putrefying and fecal matters, but it acts likewise on many other odorous substances. I will cite a curious fact in confirmation of this. Having one day inadvertently imbued my hands with a concentrated solution of carbolic acid, I could not rid myself of the penetrating and offensive smell. Repeated washings with soap, followed by applications of vinegar, chloride of lime and ammonia, failed to remove the odor. Being on the point of attending a consultation to which I was very reluctant to carry so nasty a smell, I was in despair. The idea occurred to dip my fingers in permanganate solution. The first application caused a notable diminution of the carbolic odor; after the third it had entirely gone."—*Med. Press and Circular*, June 10, 1868.

Purification of tannin.—M. Heintz (*Zeitschrift für Chemie*) purifies commercial tannic acid by dissolving it in water, and agitating it rapidly with ether that has been well purified. The decanted solution is then filtered, the ether evaporated, and the tannin obtained free from odor or evaporation.

Cinchona in Jamaica.—According to the Standard (in *Med. Press and Circ.*, July 22,) we learn that the experiment with the culture of Cinchona in Jamaica is in a fair way of success. Commenced in 1866 there were 800 plants growing in 1867, and at the present time 25000 plants are in vigorous growth. The sites chosen are from 3700 to 5200 feet elevation on the Blue Mountain range, and the whole experiment is under the direction of Mr. Robert Thompson, who believes that this culture will prove to be "highly remunerative."

ON THE RELATION OF PERCENTAGE TO DENSITY IN SOLUTIONS OF CHLORIDE OF ZINC.

By Charles Bullock.

Amount of Fused Chloride of Zinc contained in 100 *parts of solution at different densities.*

The fused chloride was dissolved in distilled water with addition of sufficient hydrochloric acid to dissolve the oxychloride formed.

Mean result of three experiments.

Per Ct.	Sp. Grav.	Per Ct.	Sp. Grav.	Per Ct.	Sp. Grav.	Per Ct.	Sp. Grav.
1	1·0082	2·05	1·0168	3·42	1·0286	7·47	1·0615
1·17	1·0097	2·16	1·0178	3·73	1·0314	8·22	1·0670
1·37	1·0107	2·28	1·0189	4·11	1·0346	9·12	1·0736
1·64	1·0133	2·41	1·0201	4·56	1·0381	10·27	1·0814
1·71	1·0139	2·56	1·0214	5·13	1·0421	11.74	1·0927
1·78	1·0147	2·74	1·0224	5·87	1·0458	13·70	1·1052
1·86	1·0151	2·93	1·0240	6·30	1·0490	16·44	1·1275
1·95	1·0154	3·16	1·0264	6·85	1·0536	20·55	1·1583

Amount of Chloride of Zinc (anhydrous) contained in 100 *parts of solution of different densities.*

A known weight of pure zinc was dissolved in hydrochloric acid, avoiding excess. The solution evaporated to the highest density, given in the table, and diluted from that point.

The densities marked * were found by experiment; the intermediate ones were calculated.

Per Ct.	Sp. Grav.	Per Ct.	Sp. Grav.	Per Ct.	Sp. Grav.	Per Ct.	Sp. Grav.
1	*1·0090	24	1·1939	47	1·3549	70	1·5133
2	*1·0186	25	1·2014	48	1·3615	71	1·5199
3	*1·0273	26	1·2088	49	1·3681	72·8	*1·5264
4	*1·0361	27	1·2163	50	1·3748	73	1·5325
5	*1·0448	28	1·2238	51	1·3814	74	1·5387
6	*1·0535	29	1·2313	52	*1·3881	75	1·5448
7	*1·0611	30·3	*1·2388	53	1·3955	76	1·5509
7·9	*1·0686	31	1·2457	54	1·4030	77	1·5571
9·1	*1·0779	32	1·2527	55	1·4105	78	1·5632
10·1	*1·0860	33	1·2597	56	1 4180	79	1·5694
11	1·0938	34	1·2666	57	1·4255	80	1·5755
12·05	*1·1016	35	1·2736	58	1·4330	81	1·5817
13	1·1094	36	1·2806	59	1·4405	82	1·5878
14	1·1172	37	1·2875	60·6	*1·4480	83	1·5939
15	1·1250	38	1·2945	61	1·4545	84	1·6001
16	1·1328	39	1·3015	62	1·4611	85	1·6062
17	1·1406	40·4	*1·3085	63	1·4676	86	1·6124
18	1·1484	41	1·3151	64	1·4741	87	1·6185
19	1·1562	42	1·3217	65	1·4807	88	1·6246
20·2	*1·1640	43	1·3284	66	1·4872	89	1·6308
21	1·1715	44	1·3350	67	1·4937	90	1.6369
22	1·1789	45	1·3416	68	1·5003	91	*1·6431
23	1·1864	46	1·3483	69	1·5068		

ON THE NEW ACT OF PARLIAMENT RELATIVE TO PHARMACY AND THE SALE OF POISONS.

By the Editor.

During the month of July a bill was before the British Parliament, the object of which was to extend the Pharmacy Act of 1852, and to amend the Act relating to the sale of poisons, and

it finally passed both Houses on the 28th of July. Those who have been cognizant of the progress of Pharmacy in England, know that for several years past there has arisen a movement among that class of dispensers who are not members of the Pharmaceutical Society, and who adopt the title of "chemist and druggist," the object of which has been to raise their status, and give them some of the advantages which have accrued to the members of the Society who are publicly known as "Pharmaceutical Chemists." The Journal called "*The Chemist and Druggist,*" edited by Mr. Brough, was instituted to advocate the claims and interests of the former class. By the Act now passed every chemist and druggist throughout England and Scotland who sells poison must be registered. The following is the *first* clause:

"From and after the 31st day of December, 1868, it shall be unlawful for any person to sell, or to keep open shop for retailing, dispensing, or compounding poison, or to assume or use the title of 'chemist and druggist,' or chemist, or pharmaceutist, or dispensing chemist, or druggist in any part of Great Britain, unless such person shall be a pharmaceutical chemist or a chemist and druggist within the meaning of this Act, and be registered under this Act, and conform to such regulations as to the keeping, dispensing and selling of such poisons as may from time to time be prescribed by the Pharmaceutical Society with the consent of the Privy Council."

The 2d clause describes what are deemed poisons by this Act, and declares that hereafter the council of the Pharmaceutical Society may, by resolution, declare any other poisonous substance which it may name in such resolution a poison within the meaning of the Act, with the consent of the Privy Council.

The 3d clause describes who are chemists and druggists within the meaning of the Act.

The 4th clause defines how assistants now existing, who have been dispensing not less than three years and are of full age, may, after passing a modified examination as described, be registered as chemists and druggists under this Act.

Clause 5th describes the manner of registration.

Clause 6th makes the Examiners of the Pharmaceutical Society to be the Examiners under this Act, with the approval

of the Privy Council, and said Examiners to give a certificate of competent skill, etc.

Clauses 7, 8, 9, 10, 11, 12, 13 and 14, refer to registration—makes the Registrar of the Pharmaceutical Society the Registrar under this Act, defines his duties under the Act, orders all registrars of deaths in Great Britain to advise said Registrar of the decease of Pharmaceutical Chemists and Chemists and Druggists, that such names may be erased from the register. Evidence of qualification to be given before registration. The Registrar to publish annually in January, a correct register of all Pharmaceutical Chemists and Chemists and Druggists, each in alphabetical order. The 14th clause describes the penalty for falsifying the register or for obtaining registration under false evidence.

Clause 15 protects the titles of those practicing pharmacy under this Act, and prevents the assumption of them by unregistered parties.

Clause 16 reserves the present rights of "Apothecaries" and Veterinary Surgeons to use and sell poisons, nor does it prevent or interfere with patent medicine makers and venders, nor with wholesale dealers in supplying poisons in the ordinary course of wholesale dealing. It distinctly declares that registration under this Act *does not* entitle the registrant to practice medicine or surgery.

Clause 17 is of much importance, and makes it "unlawful to sell any poison, either by wholesale or retail, unless the box, bottle, vessel, wrapper or cover in which such poison is contained, be distinctly labelled with the name of the article, and the word poison, and with the name and address of the seller of the poison; and it shall be unlawful to sell any poison in schedule A* (or which may hereafter be added thereto), to any person unknown to the seller, unless introduced by some person known

*Schedule A.—Part 1.—Arsenic and its preparations, Prussic acid, cyanide of potassium and all metallic cyanides, strychnia and all poisonous vegetable alkaloids and their salts, aconite and its preparations, emetic tartar, corrosive sublimate, cantharides, savin and its oil, and ergot and its preparations.

Part 2.—Oxalic acid, chloroform, belladonna and its preparations, essential oil of almonds, (unless deprived of its prussic acid), opium and all preparations of opium and poppies.

to the seller, and on every sale of any such article, the seller shall, before delivery, make or cause to be made an entry in a book to be kept for that purpose, stating the name and address of the purchaser, name and quantity of the article sold, and the purpose for which it is stated by the purchaser to be required, to which entry the signature of the purchaser and of the person, if any, who introduced him shall be affixed, any person or persons selling poison otherwise than is herein provided, shall, upon a summary conviction before two justices of the peace in England, or the sheriff in Scotland, be liable to a penalty not exceeding five pounds for the first offence, and ten pounds for the second or any subsequent offence." A reservation is made in reference to poisons exported wholesale, and to poisons in medicines dispensed, by apothecaries and others legally qualified, in prescriptions, which sales, however, are required to be registered.

The remaining clauses, from 18th to 28th inclusive, refer to the new relationship introduced by the Act, between the Pharmaceutical Society and Chemists and Druggists, and defines to what extent the latter can partake of and enter on the privileges of that Society. The Act unfortunately does not exempt th chemist and druggist from jury service, as it does the pharmaceutical chemist.

It should have been remarked that the sale of poisons in part 2d of schedule A are only required to be duly labelled and sold only by qualified persons. On the whole, we think this Act is an advance in the right direction; it opens the way to the permanent union of all the pharmaceutists of England and Scotland, removes the sale of poisons from grocers and other dealers, not registered as druggists, etc., and will require an examination of the next generation of chemists and druggists that will sift out the unqualified. The inconveniences of the sale of poison law will be great and annoying in a country where poisons like bread could be had everywhere, but they will, if carried out, accomplish to a large extent what is aimed at.

The points in the Act which in our view are most satisfactory, are the union of all Pharmaceutists, and the very decided recognition of and confidence in the council of the Pharmaceutical Society as the agent for carrying out the provisions of the bill, especially in reference to poisons.

ON THE CHEMICAL CONSTITUTION OF FLAKE MANNA.

By M. H. Buignet.

The author has made a very elaborate investigation of the constituents of flake-manna, which is published in the June and July numbers of the *Journal de Pharmacie*.

The following are the conclusions arrived at :—

1. Flake manna in its natural state possesses a very energetic rotatory power. This power is dextrogyrate; its value, brought to the plane of polarization of the yellow ray is expressed by $[a]j = + 28° 40'$.

2. The rotatory power of manna does not depend on the saccharine matter it contains, because it is found to remain the same after the destruction of all the sugar by fermentation.

3. The substance to which this rotatory power is due is *dextrine*, which has not been before isolated by chemical analysis from manna, and which forms nevertheless one of the principal elements of its composition. It constitutes about one-fifth of flake manna and a much larger proportion of the different species of manna in sorts. It can easily be extracted. It then offers all the physical and chemical characters of pure dextrine.

4. The saccharine matter (besides the mannite) in flake manna consists of a mixture of cane sugar and uncrystallizable sugar. These two sugars are found united in such proportion that they mutually neutralize their opposite optical properties.

5. The different species of manna found in commerce all contain sugar and dextrine. The absolute quantity of these two principles varies considerably one species with another, but their relative proportion is constant and invariable. Thus in various samples of flake manna as well as of the varieties of sorts, there is always found two equivalents of dextrine to one equivalent of sugar.

6. By the nature and proportion of these elements, the mixture of sugar and dextrine in manna resembles the ordinary product of the saccharification of starch. It is therefore probable that it is derived from starch by a natural process, simulating that used in the laboratory by diastase and gentle heating.

ON THE PREPARATION OF SOLUBLE IODIDE OF STARCH

By M. Quesneville.

M. Quesneville, who first introduced iodide of starch into therapeutics, advises the following method of preparing it:

Take of starch of the best quality (free from potato starch) 1050 grammes.

Iodine, in very fine powder (passed through a silk sieve) 100 grammes.

Mix the two powders carefully, and when the mixture is perfect it is to be moistened gradually, agitating without ceasing, with a mixture of 400 grammes of water and 100 grammes of alcohol. The powder gradually deepens in color, and soon becomes a beautiful black; it is left during 15 to 20 days and is afterwards dried in the air, followed by the drying-room heat. The starch, if very dry, should not be used in larger proportion than 900 grammes.

When the powder of iodide of starch is well dried, it has no odor of iodine, and contains exactly one tenth of its weight of iodine. It is completely insoluble in water, and to render it soluble it is sufficient to heat it in an enamelled pan over a very gentle fire, with continual agitation. This operation requires but little time, and the operator is apprized of its completion by the development of a pungent odor. It is well to try from time to time whether the powder has become soluble.

This operation, though easy, requires nevertheless a certain skill and attention, because if heated too strongly the solution is red and has lost iodine.

Iodide of starch powder obtained by this process suffices for the use of Pharmacy; nevertheless, if it is desired to obtain it more pure and extremely soluble in cold water and always of a beautiful violet blue, it is necessary to make a warm concentrated solution of the strength of 7 to 8 degrees of the hydrometer for salts, allowing it to deposit during several days, decant the solution and precipitate by adding only enough of alcohol to precipitate the iodide of starch. Put the magma on a linen cloth, press it as dry as possible and complete the dessication on

plates in a drying room and reduce it to powder.—*Journ. de Pharmacie, Juil*, 1868, from *Mon. Sci.*

ON PHOSPHORATED OIL.

By M. C. Méhu.

The author objects to the process of the French Codex, in which almond oil is heated with an excess of phosphorus and the oil decanted from the excess when cold. He finds that, owing to the presence in the oil of certain proximate matters, (as albumen and resin) that the solution alters by keeping, and deposits a reddish matter containing some phosphorus.

To obtain a phosphorated oil absolutely limpid and inalterable he recommends the following process employed for many years at the Necker hospital.

Take a sufficient quantity of limpid oil of sweet almond, heat it in a porcelain capsule during a quarter of an hour at the temperature of 302° Fahr., afterwards during ten minutes at about the temperature of 392° to 482° Fahr. It disengages at first vapor of water, and certain organic matters easily changed are destroyed or volatilized, at the same time that the oil is almost decolorized.

The oil thus heated by standing, deposits the impurities as a light flocculose, which may be separated after standing or at once filtered.

To transform this oil into phosphorated oil, put it into a glass-stoppered flask, well dried; add a fragment of transparent phosphorus one-hundredth part by weight of the oil used, that is to say a grain of phosphorus for every 100 grains of oil. The flask is placed in a water bath and heated to from 176° F. to 194° F., loosening the stopper several times during the heating to permit the expanded air to escape; then remove it from the bath and agitate briskly from time to time until the phosphorus is completely dissolved. The solution is rapid, the color unchanged, and no deposit occurs.

Thus prepared this oil contains one per cent. of phosphorus, whilst the oil of the Codex process contains 1·2 per cent. It is phosphorescent in the dark and emits abundant white vapors in

the air. When diluted with four times its bulk of oil of almonds it ceases to be phosphorescent in the dark and to emit vapors. The phosphorescent quality and power of emitting vapors is instantly stopped by a few drops of ether, and also by sulphuret of carbon and oil of turpentine; the oils of thyme, rosemary, cajeput, and mint, and alcohol possess this power in but a small degree, whilst bromine, bromide of ethylen, acetic ether, chloroform, the oils of chamomile, cloves, and champhor do not act in an appreciable degree.

The action of ether is best shown by opening a bottle of phosphorated oil in the dark, and then bringing an open bottle of ether near its mouth, so that the dense ether vapor will precipitate itself into the oil bottle, when the phosphorescence ceases at once.

The author recommends the addition of four per cent. of ether to the oil to prevent this phosphorescence.

The author also recommends his process with butter of cacao so as to obtain a solid phosphorated oil to be taken in capsular form.—*Jour. de Pharm., Juillet*, 1868.

NOTE ON METALLIC BISMUTH, AND LIQUOR BISMUTHI ET AMMONIÆ CITRATIS.

By Dr. Redwood.

The vicissitudes which have attended the commerce of bismuth for several years past have produced an unfavorable influence on the condition, in regard to purity, of some of the preparations of bismuth which are used in medicine. The price of the metal has undergone great fluctuations, ranging from 2*s.* 6*d.* to more than 20*s.* a pound; and, although the highest prices to which it has thus attained have been unprecedented in its previous history, the proportion of impure bismuth in the market has, at the same time, been unusually large. This unsatisfactory state of things appears to have arisen from a falling off in the supply of bismuth from those localities whence the best samples have been obtained, while new sources of supply, especially the Australian, have yielded the metal in a state in which its purification has been

attended with considerable difficulty. Of the impurities most commonly occurring, arsenic, lead, copper and silver are the most important. The bismuth may be freed from the first two of these, if present, with comparative ease, by a simple metallurgical operation which consists in fusing it with nitre, as directed in the Pharmacopœia. This is the process usually adopted, and which answers best for removing the more oxidizable metals. It may be conveniently and successfully applied to quantities of the metal varying from four ounces to a pound by means of a gas furnace. The process, however, is insufficient for the removal of copper and silver; and it is with reference especially to the former of these that the principal difficulty is experienced in purifying some of the crude bismuth and bismuth ores of commerce. At the present time large quantities of Australian ore, rich in copper, are waiting the discovery of a method by which the bismuth it contains may be economically separated in a state of sufficient purity to admit of its being used for pharmaceutical purposes. When this question has been satisfactorily solved, there is every reason to believe that a great reduction in the price of the metal will take place. In the meantime we shall have much impure bismuth, containing copper, which, although applicable for one of the purposes for which bismuth is required, —namely, the preparation of fusible metal,—is not well suited for the production of the compounds of bismuth used in medicine. Already the attention of metallurgists has been directed to the importance of providing a supply of purified bismuth for pharmaceutists, and I am assured by houses extensively engaged in this branch of metallurgy that bismuth, free from arsenic, copper, or any material impurity, may now be obtained by those who are willing to pay the price for it.* As this purified bismuth is prepared by men accustomed to such operations from the ores which yield it most readily, it will be found the most economical and best course for those who require pure bismuth to buy the metal in the purified state, or otherwise it will be necessary, in applying the process of the Pharmacopœia, to use crude bismuth which is free from copper and silver.

* I have recently purchased such at 20*s.* a pound, the price of crude bismuth being at the same time 18*s.* a pound.

With reference to *Liquor Bismuthi et Ammoniæ Citratis*, on which there has been some correspondence in this Journal, it may be stated that, if the conditions specified in the Pharmacopœia be fulfilled, that is to say, if the bismuth employed has been purified in the manner described, and if the purified metal, and also the solution prepared from it, answer to the tests as given, the latter will be free from *arsenic, lead, copper and silver*. These are the impurities most likely to occur, and to the removal or detection of which the process of purification and the tests of the Pharmacopœia are directed; but if it were the object of a manufacturer to introduce other impurities which would elude detection by the tests as given, it would no doubt be possible to do so. I have recently met with two instances of such adulteration in subnitrate of bismuth, an account of which will be found in the following article.—*Lond. Pharm. Journ.*, August, 1868.

NOTE ON A NEW ADULTERATION OF SUBNITRATE OF BISMUTH.

By Dr. Redwood.

I have recently had occasion to examine two samples of subnitrate of bismuth, which have proved to be adulterated to a great extent, by the admixture of a substance which none of the tests usually applied would detect. These samples were sent for examination by wholesale druggists who had been led to suspect that they were not genuine, but who were greatly surprised to learn the extent and nature of the adulteration.

The first of the samples was sent me last May. It presented the usual appearance of the variety of subnitrate of bismuth generally met with in commerce in the form of powder, without any crystalline character. It dissolved in nitric acid with a slight evolution of carbonic acid gas, and this had caused it to be condemned as impure, by a customer to whom it had been sent. The quantity of carbonate present in it was, however, extremely small. In other respects it answered to the Pharmacopœia tests, excepting that the solution in nitric acid gave a precipitate with nitrate of silver, indicating the presence of oxy-

chloride. This is so frequently met with in commercial subnitrate of bismuth that its detection would not have excited much surprise. Its presence is excused by manufacturers on the ground of its making the powder more suitable for some of the purposes to which it is applied, so that for such purposes the powder would be unsaleable if it did not contain any chloride. The chlorine having been estimated, and the equivalent quantity of oxychloride calculated therefrom, a further examination rendered it evident that there was something else present besides subnitrate of bismuth. The residue left, after calcination, was in excess of that which theory indicated; and this residue dissolved in nitric acid, mixed with dilute acetic acid, and precipitated with sulphuretted hydrogen, gave an amount of sulphide much below the theoretical quantity. The cause of these discrepancies was found in the filtrate, which yielded an abundant precipitate of phosphate of lime.

While I was engaged in this investigation, my attention was directed to a paper in the "Journal de Pharmacie et de Chimie" for last March, by Mr. Roussin, in which he alludes to the adulteration of subnitrate of bismuth with phosphate of lime, and describes a very simple method of detecting it. Mr. Roussin says that in one case he found as much as 28 per cent. of phosphate of lime in a sample which presented the usual appearance, and answered to the ordinary tests of subnitrate of bismuth. His process for its detection and estimation is as follows: Dissolve equal quantities of the subnitrate and of tartaric acid in nitric acid slightly diluted with water, and add to this a strong solution of carbonate of potash until all effervescence has ceased, and the liquid is rendered strongly alkaline. "If the subnitrate of bismuth be pure the liquid will be clear, and will remain so even after it has been boiled; but if the sample of subnitrate submitted to the test should contain phosphate of lime, even to the extent of 1 or 2 per cent., this will form a white precipitate, which will not dissolve with long-continued boiling."

In applying this test, it is important to observe that the phosphate of lime, even when present in large quantity, is not precipitated in the first instance after the addition of the carbonate of potash, but its precipitation is immediately effected by boiling

the solution. From the sample to which I have already referred, I obtained in this way 11 per cent. of phosphate of lime; and from another sample, which came from a different source, I have more recently obtained no less than 40 per cent. of the same adulterant.

I have reason to believe that both these samples were of foreign manufacture.—*Lond. Pharm. Journ.*, August, 1868.

ON NITRATE OF AMMONIA AND NITROUS OXIDE.

[From White's Dental Materia Medica, Phila., 1868.]

Nitrous oxide for anæsthetical purposes has come into such general use, that information is constantly asked in reference to its properties; the materials used in its manufacture; the process of generating it; how to determine the purity of the nitrate, and of the gas when made, etc.

As found in commerce, nitrate of ammonia is crystallized, granulated, and fused. The fused salt is made by melting down the crystals, and allowing them to solidify into a compact mass on cooling. The granulated is made by evaporating the solution to such a density that it would solidify on cooling, then reducing the heat and stirring the mass until it cools.

The three varieties are all more or less deliquescent, and should be kept in a dry place, excluded from the air.

The fused is generally preferred, because the amount of gas given off by equal weight of the three varieties is somewhat in favor of the fused and granulated, and the latter is objected to by some on account of its greater liability to absorb moisture and gain weight by exposure to the air. If pure, when heated on platinum foil the nitrate should volatilize completely. A residue of any considerable amount would indicate the presence of some non-volatile salt—probably nitrate of potash or soda. A solution of nitrate of ammonia should not afford a precipitate on addition of a few drops of chloride of barium, which would indicate sulphuric acid; nor on the addition of a few drops of a solution of nitrate of silver, which would indicate the presence of chlorine.

Sulphates and chlorides are almost always present in commer-

cial nitrate of ammonia; but if the solution is rendered only turbid, without affording an immediate precipitate with the above reagents, it is sufficiently pure.

The various effects of increasing heat upon nitrate of ammonia are shown by the following table:

At 226° F. fuses perfectly.
At 302° F. emits white fumes, condensing in drops.
At 347° F. effervesces slightly.
At 356° F. boils without decomposition.
At 437° F. effervesces rapidly.
At 460° F. begins to evolve gas.
At 482° F. evolves gas in abundance.
Above 500° F. *nitric oxide* is given off.

To determine the temperature, thermometers have been prepared which may be passed through the cork and into the retort, marking the following degrees: 226°, 356°, 460°, 482°, 500° F.

To obtain the largest amount of gas, the nitrate should first be melted in the retort at a temperature just sufficient (226° to 250° F.) When melted, the heat may be at once carried up to the point of decomposition, 460° F. If a gradually increasing heat is used after the salt is melted, a portion of it will sublime unchanged until the temperature reaches 460° F. The heat should never be allowed to rise above 482° F., for beyond that noxious products are generated. After the gas has begun to come over briskly, the appearance of copious white fumes in the retort is an indication that the heat is too great. The nearer the heat can be kept at the point necessary to generate nitrous oxide, the purer will be the gas.

After the decomposition has fairly commenced, the heat must be lowered rather than increased, as by that time the sand, retort, and the salt itself have accumulated enough heat to carry on the generation of gas for some time, even if the flame were entirely withdrawn.

A sand-bath should always be used to protect the retort from the direct heat, which may be supplied by means of a suitable gas-burner, or by an alcohol or kerosene lamp.

The retort must be of glass; no other practical material has yet been found to answer the purpose. The retort is usually

sold with a ground-glass stopper; but owing to the variations of temperature to which the retort is subjected, it causes trouble by being too loose at times, and difficult of removal at others. A good cork is to be preferred. These retorts are made of various shapes; that which seems to have given entire satisfaction is illustrated in the cut accompanying this article (page 412.)

The solutions recommended for washing the gas—caustic potash and copperas—are intended to neutralize any noxious products caused by the use of impure nitrate of ammonia, or by an excess of heat in the process. The caustic potash solution neutralizes any free nitric acid which may distill over. The copperas solution destroys either chlorine or nitric oxide—binoxide of nitrogen. The sulphuric acid is added to the copperas solution to prevent precipitation and insure a clear solution. After having passed through these solutions, it should not be inhaled immediately, but allowed to remain for two or three hours in the receiver over the water. It can then be tested by breathing it, and if it has not a coppery taste, and does not produce a hot sensation in the lungs, it may be relied upon as pure; but if it cannot be breathed pleasantly, it should be allowed to remain in the gasometer until it can. When pure it possesses a very slight odor and a sweetish taste. It improves by age, and in a gasometer, such as is illustrated on a subsequent page, may be kept for many weeks; for although water takes up from 5- to 8-10ths of its own bulk of the gas, after it is once saturated it will not take up any more, except as the water will gradually give out the gas and take up air through the surface exposed between the holder and receiver. It has been suggested that, if this surface were covered with a thin film of oil, this process would be entirely prevented, and gas thus protected has been said to have been retained in the gasometer for a month.

The mouth-piece or inhaler should be constructed with a double valve, preventing the exhalations from the lungs from being thrown back into the gasometer or bag from which the gas is administered.

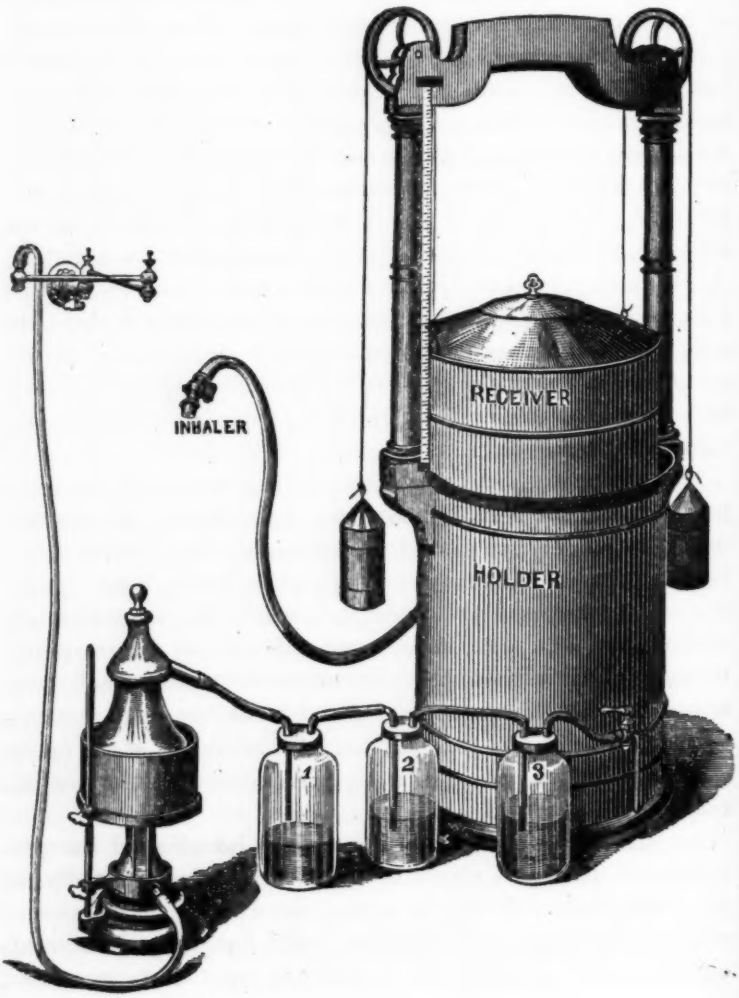
Some operators have the gasometer placed in the cellar or in a room adjoining the office, and connect with it by a rubber tubing passing through the floor or partition, thus allowing the

patient to inhale directly from the gasometer. Others prefer taking the gas from the gasometer as it is wanted, in an India-rubber bag, from which it is administered. It is only necessary, when the bag is to be filled, to connect it by tubing with the supply-cock of the gasometer, and by a little downward pressure on the receiver the gas will be forced into the bag. The capacity of the bag should not be less than eight gallons, although when breathed in and out, as some operators administer it, six gallons or less will generally produce anæsthesia. This effect usually occurs in from thirty seconds to a minute and a half; insensibility to pain is oftentimes reached before the patient is entirely unconscious. Anæsthesia is generally, although not invariably, manifested by snoring, but it is not always necessary to carry the effect to this point; and, notwithstanding the assurances to the contrary, there are many who do not believe that profound anæsthesia, produced by any agent, is entirely free from danger. At all events, it is the dictate of prudence to proceed no further than is absolutely indispensable. It is customary to hold the nose of the patient so that no atmospheric air is mixed with the gas inhaled; but this practice is energetically opposed by some, who assert that an admixture of air is positively necessary to the safety of the patient.

It is administered by some practitioners to every patient who presents, without regard to the state of the health; but there is reason to believe that caution should be observed in this direction, and that it should not be given to those having heart disease, who are predisposed to apoplexy, or whose lungs are seriously affected, nor, as a rule, in any case where there is serious disturbance of vital functions. The unconscious state usually continues from a half to one minute, and in two to three minutes almost all return to a perfectly normal condition. If the operation is protracted, more gas can be given when sensibility to pain returns.

Dr. Geo. J. Ziegler, who has carefully investigated the properties of this agent, claims that "nitrous oxide is very efficient as a restorative. It may be administered either in its gaseous state by the lungs, or in conjunction with liquids by the alimentary canal. It should be given gradually in moderate quantities,

so as not to generate too much carbonic acid. Both it and oxygen are of primary importance in asphyxia. In chemical character and physiological influence they are the direct opposites and natural antidotes to narcotizing agents and asphyxiated conditions. They should always be employed whenever practicable, as either alone or in combination with heat they will often save life, even in apparently hopeless cases."



Directions for setting up.

Place the holder in a level position, and fill it with water to within an inch or two of the lower edge of the taper rim.

A piece of lime the size of an egg will help to keep the water pure.

Now open all the spigots, especially the one in the top of the receiver, and gently sink it into the water; then close the spigot in the top of the receiver and that on the upper edge of the holder, and arrange the weights that are attached to the receiver.

Put into the first jar (No. 1) about a pint of water. Into the second jar (No. 2) such an amount of water that the long pipe attached to the lid shall dip about one inch below its level; then add a half teaspoonful of sulphuric acid (oil of vitriol) and about a quarter pound sulphate of iron (copperas). Into the third jar (No. 3) put a like quantity of water, and add a couple of sticks of caustic potash.

Arrange the jars in line and connect them by tubing, as shown in the cut. The tube from the retort must connect with the LONG pipe of jar No. 1, and so on. When properly arranged, a current of air blown into the tube intended to connect with the retort will cause the water to bubble in jars Nos. 2 and 3, and if the spigot to which No. 3 is attached be open, the receiver will begin to rise.

Put into the retort the quantity of [nitrate of] ammonia intended to be used (1 lb. will make about 30 gallons of gas).

Place the sand-dish upon the stove, with sand sufficient to protect the retort. Connect the long pipe of the first jar to the retort by rubber tubing, so that the condensed steam may run into it.

Now apply the heat gradually, and watch the process, being careful not to overheat the ammonia [salt].

The heat should be shut off before the [nitrate of] ammonia is quite all decomposed, in order to avoid breaking the retort; and before the gas has quite ceased to come over, *the retort should be disconnected from the first jar*, and the receiving spigot closed. This is an essential point, for if not attended to promptly, and the atmospheric pressure thus equalized, the solutions will be forced from one jar to another and into the retort, in consequence of the partial vacuum created by the withdrawal of the heat.

It will be understood that the first jar is merely to receive the drip; the use of the water is simply to keep the jar cool, and the tendency to become overheated may be obviated by setting it in a vessel of cold water. Fresh water may be substituted at each operation.

The solution of copperas should be renewed when it loses its green color, and the potash solution when it loses its alkalinity, as shown by its not turning red test-paper blue.

The inhaling tube is attached to the top spigot of the holder.

The register indicates the number of gallons of gas in the holder, as well as the quantity inhaled.

If by accident water should get into the pipe by which the gas enters the receiver, it can be drawn off by the little screw-plug at the bottom of the holder.

EFFECTS OF LIGHTNING.

M. Becquerel related to the Academy the fact that during the violent storm of June 21, a workman who was at some distance from the point struck by the lightning, underwent a violent shock, from the effects of which he did not recover for two days. All the nails were torn out from the sole of one of his boots, which M. Becquerel exhibited as a proof of the occurrence. Several academicians cited similar facts, and, among others, M. E. de Beaumont an instance of where the nails were torn out from the butt-ends of muskets. M. Morin also alluded to a pile of balls placed near a powder depot that was overturned two successive days during two storms which destroyed the lightning conductor. Marshall Vaillant also mentioned the case of a man struck by lightning, one of whose shoes, picked up at a great distance, was found to have had all its nails drawn.—*Med. Times and Gaz., July* 11, 1868, in *Medical News.*

LIQUID NITROUS OXIDE GAS.

Nitrous oxide gas for anæsthetic purposes has been obtained in a new form. Dr. Evans, of Paris, who was one of the first experimenters with the gas, has brought over nitrous oxide liquefied by the combined agency of compression and cold. The liquid nitrous oxide is contained in an hermetically sealed vessel, in shape something like a small cannon, made of gun metal. On turning a tap the fluid escapes, and immediately volatilizes with intense cold. For anæsthetic purposes it may be conveniently received in a "Clover's bag." The gas thus liberated has been administered by Mr. Clover in four dental cases, and in a case of strabismus operated on by Mr. Haynes Walton. Mr. Clover informs us that he still retains his confidence in the safety of this agent. He has now given it in two hundred and fifty cases without the slightest misadventure, and he has no reason to regard it as specially dangerous.—*Med. Times and Gaz. July* 11, 1868, in *Medical News.*

WELL'S PROCESS FOR COPPER-PLATING IRON.

This process yields a coating of copper of great brightness and strong cohesion. The object, whether of cast or wrought iron, is freed from rust by immersion for from five to ten minutes in dilute muriatic acid (2 in 100 water) and subsequent scrubbing for a quarter hour with a wire brush and sand, then washing in water until all traces of acid are removed. It is then covered with zinc-wire in spiral turns of about six inches from each other, which also serves as a means of suspension. The bath consists of a solution of caustic soda (8 p. c.) of which 11 quarts are mixed with 50 ounces of Rochelle salts and 12½ of blue vitriol, making a liquid of a density equal to 19° Beaumé. It retains its activity as long as the copper is kept replaced, and deposition from it proceeds with great regularity. The material of the vessel is best when made of wood, lined with gutta percha and covered with a wooden lid.

When the coating is of sufficient thickness, the object is removed from the bath, first washed with water slightly acidified with sulphuric acid, and then with pure water until the disappearance of all traces of acid; after this it passes into a drying room heated to 132° F. The bronzing, when required, is obtained by a bath of sulphide of sodium, or by means of the same bath as above, somewhat modified, that is, by increasing the proportion of copper to a threefold, in which case the bath no longer deposits copper, but, to all appearances, bronze.

By reducing the points of contact between the iron and wire, though retaining the spiral turns at uniform distances, the deposit gradually assumes a number of colors in the following series, viz.: *orange*, *silver-white*, *pale yellow*, *golden yellow*, *carmine*, *green*, *brown*, and *dark bronze*.

As soon as the desired color is attained, the object is washed in warm water, and again dried at 132° F. Between each subsequent change of color is an interval of about five minutes. The reaction is more decided when the alkaline reaction of the bath is stronger.

For in-door work or ornaments the time of immersion may vary from 3 to 72 hours; for out-door objects a much longer

time would be necessary, as many as three to four weeks in some cases. To avoid the tediousness of this operation, the immersion in the alkaline bath is only continued for 12 to 18 hours, but after washing in warm water the coated objects are then placed for 12 or 24 hours in an ordinary solution of blue vitriol, which will increase the deposit quite as uniformly, but much more rapidly. In this manner a coating up to one-fifth millimetre in depth may be formed, which is sufficient for out-door work, and even exposure to water.—*Kuhnheim, Druggists' Circular*, Aug., 1868, from *Dingler's Journal*, vol. 188, p. 286.

A NEW METHOD FOR GILDING COPPER WIRE

Has been invented by Mr. Hélouis (36 rue Meslay, Paris) by which the blackening so common with ordinary gilding is prevented. It is partly the same plan as that by which platinum or gold-wire of extreme tenuity has been made, *i. e.*, by enclosing these metals within a cylinder of silver or copper, and drawing them out together to a fine degree of fineness, when on treatment of the wire with dilute nitric acid, the outer coating is dissolved, leaving a continuous thread of the metal not affected by the acid. In the present case, however, the purpose is to coat the copper-wire with a thin film of platinum, upon which gold may then be deposited without danger of its subsequent blackening, as generally happens when deposited upon copper or even silver, and the object is accomplished by enclosing the cylinder of copper in a heated ring of platinum, which latter, on cooling, contracts and firmly attaches itself to the inner cone; then the drawing-out process proceeds as usual, the resulting copper-wire being coated uniformly with a thin layer of platinum, upon which the gold may be readily and permanently deposited. This process is also more profitable, because the scraps, etc., of wire, which accumulate in working it, are valuable enough to be collected for the purpose of recovering the precious metals. *Druggists' Circular*, Aug., 1868, from *Dingler's Journal*, June, 1868.

ON THE GATHERING AND CURING OF CARRAGEEN IN MASSACHUSETTS.

By G. Hubert Bates, Scituate, Mass.

Sub-order: Rhodospermeæ, family Spongiocarpeæ.—*Harvey.* The generic name, Chondrus, is characteristic of the substance of the frond, being derived from the Greek word signifying cartilage.

Habitat: Rocks in the sea. Perennial; spring. Root: a disk throwing tufts of many fronds, which are from two to twelve inches high, very narrow and subcylindrical at base, but immediately becoming flat, generally dilating from the base till it becomes three or four lines wide, and then dividing repeatedly and dichotomously (by pairs), each division spreading, becoming narrower than the preceding one, and taking place at shorter intervals. The summits are bifid, the segments varying greatly in length, rounded or acute, straight or curved, and often twisted in such a manner as to give the curled appearance denoted by the specific name, crispus. "Fructification roundish or roundish-oval, sub-hemispherical capsules imbedded in the disk of the frond, prominent on one side and producing a concavity on the other, containing a mass of minute, roundish, red seeds." Its color is a deep purple-brown, often tinged with purplish red, paler at the summit, and becoming greenish and at length yellowish-white, as the season advances.

This is the proteus of marine algæ. The varieties are innumerable, and pass into one another so insensibly that it is almost impossible to define them. There is great range in regard to the width of the frond. Whenever the plant grows more or less exposed to fresh water, a still greater change is wrought in its appearance. The main divisions are much broader, fewer, and exceedingly irregular, while the margin and extremity are beset with such a vast number of small segments that the whole suggests the idea of monstrosity. In such specimens the frond, when held between the eye and the light, is thinner, more transparent, and frequently mottled with green. It occasionally happens that the margin is somewhat raised, so as to render the frond slightly channelled, but seldom so much as to allow of its being

mistaken for *C. mammilosus*. The pink seeds are very conspicuous when held between the eye and light. When fully ripe, the capsules fall away entirely, and leave the frond full of holes. Greeville concludes his admirable description—parts of which are included in the above—by remarking that "it is difficult, in words, to convey any idea of the variableness of this species."

The varied uses of carrageen in manufactures make it an article of considerable importance; and the present high prices of glue and isinglass, for which it is an excellent substitute, have created a demand for it heretofore unknown. Up to about the year 1848 all the carrageen consumed in this country was imported from Ireland, which gave it the popular name of Irish moss. It was collected on the southern and western shores of that island, and was converted into size for house painters, and also esteemed for medicinal and culinary purposes. That imported to America was used in making custards and *blanc-mange*, and sometimes sold as high as seventy-five cents per pound, retail. In 1849 several parties commenced making a business of gathering and curing *Chondrus crispus* at Scituate, Plymouth county, Massachusetts, and produced the first considerable quantity of the domestic article ever sold in Boston. This is still the only point in the States where any noticeable amount is collected, the business having lately been largely increased, until the annual crop is not far from 500,000 pounds—equal to about 6,000 barrels.

Its range.—Some sea-weeds are cosmopolitan, and are equally abundant in all latitudes; but generally algæ are more or less local in their distribution, and different marine floras are found in the different parts of the ocean. The degree of exposure to light, and the greater or less motion of the sea, have an important effect. The green algæ occur either in the shallower parts of the sea or in fresh water; the olive color is characteristic of those sea-weeds that abound between the tide-marks; while the red-colored species grow in the deeper and darker parts of the ocean.

The sub-order Rhodospermeæ, in which Harvey classes the *Chondrus crispus*, seem to flourish in the temperate zone, while Chlorospermeæ increase as we pass northward, and Melanosper-

meæ towards the tropics. But while *Chondrus crispus* appears, under certain conditions, to abound in the temperate zone, it is generally incrusted with various minute mollusca, that causes its rejection by the dealers. The rocks on the shores of Scituate, in the main, undoubtedly produce the best article yet discovered in this country. But there are ledges here, where the muscle attaches to the plant, that are wholly abandoned by the mossers. Indeed, the range of the clean-growing Chondrus seems to be very limited.

It has been remarked by those who have visited Cape Ann and the eastern shore for the purpose of testing the quality of the moss growing there, that the product of those parts is of a coarse and limy character. Perhaps, however, this moss, in some instances, may be susceptible of improvement. The old plant should first be entirely removed, which would be immediately succeeded by a new growth; and if this exhibits a marked superiority over the old plants much may be expected of the ledge, for each successive "pull" will produce an improvement in the moss. That the abundant moss growing to the eastward has not been fairly subjected to this test, and the improved article brought into market, indicates either a want of knowledge of the necessary process of improving, or the absence of those whose habits would naturally lead them to engage in the business; or it may be that the plant in that quarter is not susceptible of any improvement, as the report goes.

As regards perpendicular direction, Forbes remarks that one great marine belt or zone lies between high and low-water marks, and varies in species according to the kind of coast, but exhibits similar phenomena throughout the northern hemisphere. This is denominated the littoral zone, and necessarily varies according to the rise and fall of the tides. If I am right in my identification, the *Fucus canaliculatus* forms the upper sub-region of this zone, followed by a broad belt of *F. nodosus* and, perhaps, *F. versiculosus* and *F. serratus*. This is succeeded by a narrow belt of *Chondrus crispus*, interspersed with *Rhodomenia palmata* and *Laminaria saccharina*, which is exposed only at low ebbs. The *Chondrus crispus*, however, extends some distance below low-water mark in to the laminarian zone, its fronds increasing in

width as the water becomes deeper. The laminarian zone extends to a depth of from seven to fifteen fathoms. Here the great sea tangle, *Laminaria digitata*—improperly called kelp—abounds.

Gathering and curing.—The mossers begin the "pull" of moss late on the spring tide of the full moon of May. This is earlier than it should be, for moss, like the grass in our pastures, attains but a feeble growth in the month of May. This prematurely-gathered moss suffers a great loss by shrinkage, and cannot be made to "hold its color" when bleached. This practice is probably owing to the restlessness of those mossers who, having no gardens to plant, or but small ones, become weary of the idleness of winter, and are anxious to resume their customary labor.

Before any moss is pulled, however, the "bleaching beds" are carefully prepared. For these, sandy portions of the beach near the creeks are selected. The stones thrown upon the old beds by the action of the sea are raked off into something like windrows, which divide the plats. The contents of the shanties are overhauled. Hand-barrows, pulling-rakes, turning-rakes, and washing-tubs are put in order or replaced with new articles. The boats receive careful inspection. A coat of paint or an application of tar is, perhaps, the result. These boats are frequently loaded to the water's edge, and, when the supply of the more adjacent ledges is exhausted, often perform trips of several miles with such a freight. A leaky boat would be unpleasant—not to say dangerous. The "navigation" is, however, generally very safe, notwithstanding it is over ledges of rocks that are known to all mariners as extremely dangerous to shipping.

The Chondrus-bearing ledges are all within a few miles of the celebrated Minot Ledge light-house. Seven shipwrecks have been counted at one time on this shore, all in plain view. The light-tower rises ninety feet from a submerged rock, but at this writing the sea breaks against it so high that at times it is entirely hidden from sight! Yet in a few months scores of men will be moving about among these rocks, gathering a crop that hardly one in a thousand in the States knows anything about!

The tools of the moss gatherers are few and simple. The

pulling-rake is the most important. It is a long-handled rake, with long, flat, iron teeth set closely together. The tub is a half hogshead; the turning-rake, a common hay-rake; while the boats vary considerably, but are good in a sea-way, especially when handled by experienced men.

The spring tides are selected for pulling, because the tide ebbs out lower than at common or neap tides. Spring tides occur at every new and full moon, when it is always high water a little before twelve o'clock; so the pulling comes at morning or evening, or both. The spring tides also expose a superior and cleaner variety of the plant, which is "hand-pulled" and carefully cured. Apothecaries buy this, and in the form of delicate blanc-mange it finds a welcome at the table and at the couch of the invalid.

The period of the spring tides is an exciting time with the mossers. The song of the boatman as he rows, the merry laugh and frolic of the boys, indicate that harvest time with them has come, and that before the husbandman has sown his corn! It is not intended to intimate, however, that moss-raking is as pleasant as raking red-top and clover. On the contrary, many tough farmer boys, after wading and pulling moss among the rocks on a cold morning in May, would doubtless abandon the business in disgust. A nervous man would hardly like it. There is a certain animal that roams among the rocks around, with such powerful pincers as to inspire a constant solicitude for the extremities, and woe to the luckless wight who comes in contact with them. Over a hundred thousand lobsters are taken annually by the fishermen of Scituate.

At the earliest dawn the boats are launched and rowed to the rocks, where the best quality may be found. If it is a very low ebb, the boat is forced as far among the rocks toward the shore as it will float, and the "hand-pulling" is vigorously commenced. The gatherers are not confined to the rocks immediately adjacent to the grounded boats. These exhausted, they wade to others and pick into baskets. Great care is constantly exercised to get good, clean moss, free from minute shells and tape-grass, for upon this the mosser reckons his price per pound. This pull also receives particular attention in bleaching and packing, and finally fetches two or three times as much as the common kinds.

As the tides in ebbing finally cease to expose the belt of rocks that produce the favorite variety, the marine farmer repairs with boat and rake to the outer Chondrus-bearing rocks, whose abundant crops wave and surge with the swell. Here the iron teeth do great service, coming up filled with a variety that contributes largely to the wants of the brewer and the cloth manufacturer. This moss is never so free from a living coating as the hand-pulled, and is mixed at first with tape-grass (*Vallisneria spiralis*) and other foreign substances. If he be an honest mosser you will, nevertheless, get a good article. Some men can scarcely fail to make good carrageen of any gather, and they should be encouraged. Messrs. Howe & French, of Boston, are doing more in this direction than any other dealers.

The advancing tide or a laden boat compels a return to the shore. The boat is shot upon the beach, and the hand-barrows come into use. Two men soon carry away the load to the top of the beach, where it is spread on the bleaching-beds to dry. The remaining process any good housewife of the olden time well understands. Like the linen at the spring, it must be alternately wet and dried until the proper degree of whiteness is attained.

The washing is done in the tubs on the banks of the creeks which intersect the marshes and often approach the beach. Salt water alone can be used, as the moss is very soluble in fresh. The tubs are quickly filled with a "long-handled" bucket, which must be an Irish invention, taking rank with the long-handled shovel. It is, albeit, a very expeditious method of filling half a dozen half hogsheads. In the "wash" the moss is well rinsed, and all floating pieces of tape-grass picked off. The water is then allowed to drain off, provided there be any unabsorbed, and the tub thrown on to its chine and dexterously rolled back to the beds. The spreading is repeated, and presently the whole is turned with a rake, the curer, if he be a careful one, still picking out the poor pieces. The mosser gives a great deal of attention to the bleaching, which, in fine weather, is accomplished in about six washings. At low tide he still continues the pull with the boat and rake.

When the beds are covered with moss the heavens are as

anxiously scanned as ever in hay time, and on the approach of rain a bustle is incident that is only equalled by that of the hay-maker. The moss, if dry, is snugly cocked up like hay, and covered with canvas. If the bad weather continues some time, it is as fatal to the carrageen as to the hay, and is bound to turn out a damaged article, if circumstances are not the most favorable. If exposed to a long rain it rapidly dissolves.

At the spring tides the beds are generally covered with the freshly gathered moss, looking black and uninviting; but as the bleaching advances, the peats first appear to turn to a delicate red color, and finally assume a yellowish whiteness that is very pleasing to the eye. When the carrageen is properly cured it is stored in bulk in the shanties. As leisure comes, it begins to find its way into barrels. This is a time of temptation. A barrel of well-cured and honestly packed moss should certainly never exceed a hundred pounds, and the average weight should be less than that. They frequently are made to weigh one hundred and twenty-five pounds. Specimens of our beach sand have doubtless been admired wherever Irish moss has found a consumer. Sometimes the moss *gathers dampness* at packing time, which is the more singular, as the weather is generally dry.

The careful mosser still picks over, and sorts as he picks, and his moss is now a white, clean, and salable article. A boy "treads in" as the final picking goes on. The nails that jingle in his pockets to the tune he whistles will hold the hoops and heads in their places. The barrel then awaits shipment, per packet, to Boston.

About the first of September the majority of the mossers close up their work on the beach, and fit out for the herring fishing. A few linger and cure another pull, if the weather favors.

As the number of men who make it their business to collect and cure this plant is increasing every year, the question is often asked, "Will it run out?" It is not certain that the rocks, like some well-tilled soils, are increasing in depth and fertility, but it is certain that the moss grows of a better quality and quite as quickly the oftener it is pulled.

Its uses.—There is always a demand for a prime article of Irish moss for culinary purposes, but the amount thus consumed

is comparatively small, as a limited quantity of moss yields a large amount of jelly. In the form of blanc-mange, it is an agreeable and nutritious article of food.

In Ireland carrageen is highly esteemed for its medical virtues, being regarded by some as a universal panacea. It was once a fashionable remedy in consumptive cases. As a demulcent for colds and fevers, it is very effective. Carrageen has been much confounded with *Cetraria islandica* (Iceland moss), which contains starch along with a bitter principle, used as a tonic and demulcent. This opinion has extensively prevailed, and many still assert that the edible algæ of Ireland and the lichen of Iceland are identical.

Its most important use is as sizing, it being used in the manufacture of cloth, paper, and felt and straw hats. The poorer qualities of moss are bought up for size. The hand-pulled moss, however, contains more starchy matter than the variety which is never exposed to the air. The second quality of moss is sold to the brewers. All beers when well brewed and sound, after a certain repose, become transparent or "bright," as it is sometimes termed. When, however, beer is sent out very new, it is necessary to "fine" it, or impart to it that "brilliant transparency" which is so agreeable to the eye. This is done by means of finings. In Europe isinglass is used for this purpose, and a lengthy formula is given for its preparation; but in this country Irish moss performs the same service without any preparation other than that given it by the curer. A certain amount of the moss is boiled up with the beer. The fluid gelatine unites with the tannin of the hops and forms a flocculent mass, which, enveloping the suspended feculencies, produces the clarifying action desired. The impurities are removed in the form of scum, while with isinglass they are carried to the bottom in the form of sediment. The beer is called "stubborn" by the brewers when a disengagement of carbonic acid gas occurs, the flocculent particles being thereby kept moving about without clearing the beer.

It is also used for fining coffee, and if it has no other recommendation, it is certainly cheaper than eggs.—*U. S. Agricultural Report for* 1866.

THE ANIMAL CHARCOAL USED IN SUGAR REFINING.

(Transactions Philosophical Society Glasgow, May 4.)

Dr. Wallace stated that his communication to the Section was not to be dignified by the name of a research, but as his name had been associated with the chemistry of sugar-refining during the last ten years, he thought it likely that, as a result of his observations and experiments, he might be able to mention some things not contained in books. He stated briefly the mode of making animal charcoal from bones, and mentioned the principal Scottish manufacturers of the substance. All the bone char made in Glasgow, Paisley, and Greenock, in addition to a large quantity imported from France and Russia, is used in the Clyde refineries. A large amount of it is manufactured; for notwithstanding the fact that the charcoal lasts a considerable time, it has to be occasionally renewed, owing to the stock gradually dwindling down from various causes. The author calculates that the quantity of animal charcoal in actual use in the Clyde refineries is probably well nigh 5,000 tons, and that the annual renewal is probably about 1,500 tons.

The carbonisation of the bones is usually continued for twelve hours, that length of time generally giving better charcoal than when the bones are only carbonised for six hours, even though in the latter case the heat is made stronger. After the bones are charred they are crushed between rollers, and the charcoal is ready for use when the dust is removed. The quality of the char varies with the kind of bones employed, and the care observed in the charring operation. Hand-picked home-collected bones make the best charcoal. Besides these there are the shank bones from the *saladeras* of Brazil and Buenos Ayres; camp bones dug up from old battle fields, and bearing evidence of having been buried for a long time, and the charcoal from which may be easily distinguished from that prepared from home-collected bones; and there are also large shipments from Italy and Turkey, including the bones of the camel along with those of cattle, antelopes, sheep and horses.

In the analysis of the best charcoal from home-collected bones, carbon usually occurs to the extent of about ten per cent., the the remainder being the phosphates and other mineral ingredi-

ents of the natural bones. The carbon varies with the amount of grease and gelatin left in the bones after boiling, and it also varies in the different parts of the same bone,—the hard exterior containing less than the extremities and spongy interior of the bone. Charcoal as met with in commerce usually contains about ten per cent of water, as water is used to cool the char as it is drawn from the retorts.

The author then stated generally the method of conducting the analysis. It presents certain difficulties, notwithstanding the apparent simplicity of the composition of bone charcoal. He instanced carbonic acid as offering some difficulty, and said that his own method of estimating it was less complicated than the one given by Fresenius, although the latter is otherwise equally good. The method used by some chemists of precipitating the phosphate of lime, and then throwing down the lime in the filtrate in the usual way, he characterized as giving entirely fallacious results. Free lime has been occasionally found by the author, but only in minute quantity. Before estimating the carbonic acid the finely pulverized charcoal should be treated with solution of carbonate of ammonia.

Chemists have long been aware of the presence of nitrogen in animal charcoal, but the custom hitherto has been to include it in the carbon. Dr. Wallace finds it to vary in amount, and to diminish in quantity as the char is used. He found it to be 1·55 per cent in a total of 8·5 of so-called carbonaceous matter in char made from home-collected bones; and in another sample made from foreign bones it was 1·08 out of 9 parts of carbonaceous matter. Two samples of moderately old charcoal gave respectively ·3 and ·55 of nitrogen, while the carbon was reported at 15 and 17, respectively. The author did not venture to say whether or not the nitrogen plays any important part in the decolorising action, although, he said, no really good decolorising agent exists that is not made from an animal substance. It is not enough that the charcoal should be porous, for wood charcoal is so, and yet it is practically useless as a decoloriser.

Traces of ammonia always exist in new char, but the amount is so minute that the author has never estimated it. Frequently, however, it exists in the form of sulphide of ammonium, a com-

pound which greatly damages sugar run through it. Such char should be well washed and reburned before being used. The washing removes common salt, ammonia, and the sulphide of calcium which is likely to be present if the char has been overburnt. The last-mentioned substance is due to the decomposition of the sulphate of lime, and acts injuriously on the sugar. Sulphuretted hydrogen is also given off from overburnt charcoal when treated with water or acid. A sample of new char gave ·08 per cent. of sulphuretted hydrogen on treating it with hydrochloric acid. Combustible gases are frequently given off by both old and new char, and sometimes they form explosive mixtures with the air of the cisterns.

Speaking of the mechanical properties of animal charcoal, Dr. Wallace said that he had long regarded the bulk occupied by the char as compared with its weight as a property of great importance. He stated that a ton of new and dry char fills a space of about 48 or 50 cubic feet, while a ton of old char may fill no more space than 40, 35, 30, or even 28 cubic feet, the apparent density of dry charcoal thus becoming sometimes nearly double what it was. But the absolute specific gravity of old and new charcoal varies but very slightly. That the charcoal rapidly diminishes in bulk while the real gravity remains practically unaltered is a point of great importance, and one to which the author thinks he was the first to direct the attention of sugar refiners. The inference is that, by frequent re-heating, the particles of charcoal become smaller, owing to the diminution of the pores; hence the apparent gravity of char gives a ready and certain indication of its value in sugar refining. From experiments made by Dr. Wallace, a specimen of a new char lost as much of its porosity by burning in a covered crucible during eleven hours as it would have lost by re-burning about one hundred times in a sugar-house. He is of opinion that the porosity of the charcoal is diminished by a sort of agglutination of the particles of phosphate of lime during the re-heating. New charcoal will hold from 80 to 100 per cent. of water, and is made preceptibly wet with 20 per cent. of water, while old charcoal (two or three years in use) will only hold from 30 to 45 per cent., and is made preceptibly wet with only 5 per cent. of

water. These facts prove that the pores become either smaller or less numerous as the charcoal is used, and point to the conclusion that, to keep animal charcoal in the most efficient state, it should be re-burned in such a way as to lessen the porosity as little as possible.

Dr. Wallace finds that, although the action of heat is the main cause, it is not the only one concerned in producing an increase in the apparent gravity of the charcoal. The proportion of carbon may increase during use from 8 or 9 per cent., to 14, 15, or even 19 per cent.,—this increase being derived from the organic impurities in the sugar. The carbon obtained in the carbonization of these impurities is deposited partly on the surface, but largely also in the pores. This is found to be a great evil, and a great point is gained if it can be prevented. That it can be prevented is proved by the fact that in some refineries the amount of carbon does not increase, while in others it even decreases, but this is owing to mismanagement in the re-heating. When the retorts are quite tight, and the heat not excessive, the carbon necessarily increases if the precaution be not taken to wash well before re-burning, so as to remove all the organic matter absorbed from the sugar liquor. To do this, boiling water is requisite, and one of the most advanced of the Clyde sugar-refiners insists that *the charcoal should even be boiled with the water.* The author's experience accords with that of the sugar-refiner referred to.

In ordinary cane sugars there is from half to one per cent. of soluble mineral matter, consisting of salts of potash, soda, lime and magnesia; and in beet sugars there is much more—from 1½ to 3 per cent., and sometimes as much as 6 or 7 per cent. The highly soluble salts, such as the salts of potash, do not affect the charcoal, and only annoy the refiner by accumulating in the syrups; but the sulphate of lime is detrimental, owing to its comparative insolubility, and to the fact that it is readily absorbed from the sugar liquor by the charcoal. It may be removed, however, by copious washing and boiling, and it is even removed in solution by washing with weak sugar liquors. Such charcoal is sure to have its sulphate of lime increased if it be washed with water naturally containing that substance in large

quantity. The author stated that he had analysed charcoal containing 2½ per cent. of the salt, and that the usual amount in old char is from half to three-quarter per cent., but that in extreme cases it may be present in Clyde charcoal to the extent of 1 per cent. The carbonate of lime present in some hard waters is also absorbed by the charcoal.

The author briefly considered the offices fulfilled by the various ingredients of the charcoal. Animal charcoal has great power of absorbing gases, coloring matters, and such mineral salts as are but slightly soluble in water. The removal of coloring matter is the chief object in view; but gummy and other extractive matters have also to be removed. Animal charcoal extracts them both with equal facility. The author finds that it readily absorbs ordinary egg albumen and gum, and he thinks that the circumstance that each of these bodies has an insoluble modification may have something to do with their absorption by the charcoal. Iron is readily removed from sugar liquors by passing them through a cistern of new char. It is the nitrogenous carbon which is the most powerful decolorising ingredient of the char, for if the char be burnt perfectly white, on the surface and without, it does not remove the slightest trace of coloring matter. This fact the author has demonstrated by actual experiment: it is with him no mere opinion.

The highly porous carbon is not the only useful ingredient, although it is essentially the decolorising agent. Carbonate of lime is also of use in neutralising the small proportion of free acid present in almost all sugars except beet; and it is still more important in neutralizing the lactic and other acids formed in the weak liquors, by a process of fermentation which it is difficult to prevent. Hence charcoal deprived of its carbonate of lime is objectionable, and its use is certain to produce sour liquors and give rise to the presence of iron in the low-class sugars. As the water of Greenock and Glasgow contains only traces of carbonate of lime, the quantity of that salt naturally present in charcoal gradually lessens, until in pretty old char it is sometimes reduced to about 1½ per cent. In refineries conducted on scientific principles the amount is never suffered to fall so low. If it falls below 2½ per cent., sour liquors are sure

to follow. When very hard water is used the carbonate of lime either decreases very slightly or it increases, and sometimes even to an alarming extent, as in the continental beet refineries, where the evil is a very serious one.

Dr. Wallace referred to the various methods—especially those of Beanes and Gordon—for getting rid of any excess of carbonate of lime in the charcoal; and then spoke of the inconvenience attending the use of animal charcoal in sugar-refining, owing to its oxidizing influence upon the organic matters extracted by the char from the sugar, and to the alteration of the nitrogenous compounds by means of which fermentation is induced, and ultimately organic acids are formed at the expense of the sugar. These acids make the washings sour and putrid, and a necessary and evil result of that is that they decompose sulphide of calcium or sulphide of iron in the charcoal, and dissolve carbonate and sulphate of lime and oxide of iron; then, as the washings are either thrown back amongst the other products of the refinery, or mixed with a fresh lot of raw sugar, they occasionally cause an immense amount of mischief. The author said that, owing to its importance, this department of sugar refining had occupied a good deal of his attention, and he claimed to have made known to refiners the means of entirely preventing such injurious results as those referred to. His method is a follows:—While the liquor is on, the char cisterns are kept at a temperature of at least 150° Fahr., so long as the liquor is strong, to prevent fermentation. Then the water used for washing down the sugar is to run on quite boiling, and this is done with all the washings which are to be preserved. When these directions are attended to, there is no difficulty with sour washings, or with the presence of iron in the low-class sugars. The char should ultimately be washed with boiling water for 10 or 12 hours, or even boiled with it.

The author concluded with a detailed account of the modes of re-burning charcoal, and of the good and bad qualities of the different kinds of re-burners now in use, and suggested the directions in which improvements might be made.—*Lond. Chem. News, May* 22, 1868.

ON THE SOURCES OF SULPHUR USED IN THE MANUFACTURE OF OIL OF VITROL OR SULPHURIC ACID.

By James Mactear, F.C.S.

Of the Alkali Department, St. Rollox Chemical Works.

After making some few preliminary remarks, Mr. Mactear proceeded to say that the quantity of oil of vitrol manufactured in this country exceeds 500,000 tons per annum, and of this quantity about 320,000 tons are used in the conversion of common salt into sulphate of soda, for the production of alkali by Leblanc's process, the remainder being taken up chiefly in the manufacture of artificial manures. The sulphur consumed last year, in making oil of vitrol, amounted to 160,000 tons, but of this quantity only from 10,000 to 20,000 tons consisted of brimstone; the remainder is obtained from pyrites, of which upwards of 375,000 tons were burned. The brimstone is used chiefly in the manufacture of "sale acid," and this again is used mostly for bleaching purposes, which require a very pure acid, that made from pyrites being always more or less contaminated with arsenic and other impurities of a detrimental character.

Since the year 1851 the price of brimstone has been very high, owing to the great quantity of sulphur required in the treatment of the vine disease.

Up to the year 1856 all the pyrites used was obtained from Cornwall and Ireland, except a small quantity of "coal brasses" found in the coal-fields. In that year some cargos of Spanish pyrites, containing a small per-centage of copper, were imported and used by the Tyne manufacturers, who liked the ore very much, on account of the high percentage of sulphur which it contained; while it is burned at as low a cost per ton as the ore of low strength. At least one half of the ore now used is Spanish cupriferous pyrites. The author illustrated the economy of working pyrites by stating that Irish ore contains about 35 per cent. of sulphur, while Spanish ore contains as much as from 45 to 50 per cent.; and, assuming that the cost of burning in both cases is 2s. per ton, in the one case 35 parts, and in the other from 45 to 50, are burned off for the same amount. But it is found that the refuse contains, in both cases,

about 5 per cent. of sulphur on the average, so that there is actually burned off 86 per cent. of the sulphur of the Irish ore, and 89 per cent. of that contained in Spanish ore of 45 per cent. strength, thus giving a clear gain of 3 per cent.

Mr. Mactear then referred to certain disadvantages attending the use of pyrites instead of Sicilian sulphur :—

First. A greater amount of chamber space is required for burning pyrites than for sulphur. This is usually taken to be in the ratio of 45 to 30, and is due to the fact that the iron of the ore is peroxidised during combustion, and therefore uses extra oxygen and nitrogen (which passes on unchanged); and for the extra amount of both of these gases chamber space must be provided.

Second. The arrangements for burning pyrites are much more closely than for burning sulphur; the heat is greater, and therefore there is more wear and tear of the chambers and connecting-pipes.

Third. There is always a larger percentage of nitre required with pyrites than with brimstone.

Fourth. Owing to various causes, the acid produced is of inferior quality.

Fifth. It involves more labor to work pyrites than to work brimstone; and there is a large amount of refuse—approximately three-fourths of the weight of the raw ore—for which room has to be provided.

Sixth. In burning pyrites, and during transit, much *small* is made, and this cannot be burned properly unless in a separate furnace. The most common form is a muffle furnace; in it the "smalls" are roasted, with free admission of air, but the quantity passed into the chamber is so great, in proportion to the sulphur, that this method is objectionable.

Taking all these disadvantages into account, it is found that, in making ordinary sulphuric acid, one ton of sulphur, in the form of pyrites, costs only £4 10s., while Sicilian sulphur costs from £6 to £7. The ore is usually sold at so much per cent. of sulphur per ton; for some years the rate was 1s. per unit, at present it is 8d.

Theoretically, 100 parts of pure sulphur should yield 306·25 parts of oil of vitriol, and in practice it is found that 100 parts of brimstone, containing one per cent. of impurity, can be made to yield 302 parts of acid, while with pyrites the acid produced only amounts to 285 parts of the sulphur actually burned, or 275 parts on the sulphur actually present in the ore.

The author then referred in detail to the several sources from which the required sulphur is obtained. He spoke of them in the following order, and illustrated his remarks by a very extensive collection of specimens :—

Sicilian Sulphur.—This is found chiefly in the volcanic districts on the south coast of Sicily, more or less pure, and imbedded in lime and clay marl. It is extracted from the crude mineral in various ways, according to the richness of the material. If the mineral is very rich, it is simply melted in a cast-iron pot, and then the liquid sulphur is ladled out into moulds; but if the mineral is poor in sulphur—some kinds containing only 15 to 20 per cent.—it is distilled in earthen retorts, and usually condensed in water. As imported into this country it consists of three qualities—"firsts," "seconds," and "thirds." The latter only is used in making oil of vitrol, the others are refined for making gunpowder.

Spanish Pyrites.—In the author's opinion, this mineral claims the first attention, owing to its forming at least one half of all the pyrites burnt in the sulphuric acid manufacture. It is found chiefly in the province of Huelva; the deposits pass, however, from Spain into the adjoining part of Portugal. Some of the deposits are nearly a mile long, of great depth, and of varying width. Till lately, the great bulk of pyrites imported was brought chiefly from Mr. Mason's mines, near the river Gaudiana. The owner was the first person to construct a railway as a means of transport from the mines to the coast, instead of the antiquated and expensive method of mule carriage. Mules are still employed at all the other mines, and the mineral is carried in sacks or baskets on the mules' backs. A few years since, the Tharsis Mining Company, consisting chiefly of Glasgow capitalists, was formed to purchase and work a number of

mines. The pyrites from the Tharsis mines are now used largely, and the imports of Mr. Mason's ore have been much reduced. The latter usually contains about 50 per cent. of sulphur, besides 3 or 4 per cent. of copper. The Tharsis mineral contains 48 to 50 per cent. of sulphur, and 4 to 5 per cent. of copper. Both kinds are much the same in their working qualities; they burn well, and make comparatively little dust in breaking.

Norwegian Pyrites.—Many mines of pyrites occur in Norway, but those in the vicinity of Drontheim are the most important. The Norwegian ore is pretty largely imported into this country, but chiefly to the Tyne. The largest quantity is raised in the mines Ytteröen, the annual product being from 6,000 to 8,000 tons. It consists of very small crystals, is of good quality, burns well, and does not slag in the kilns. It contains about 44 per cent. of sulphur, and from 1 to 2 per cent. of copper. Under this head Mr. Mactear referred to a second quality of this mineral; to an excellent variety obtained about 30 miles from Drontheim, and containing but a trace of copper; to the ores obtained from some mines opened lately near Bergen; and to another variety which comes from Nordland, yielding 42 per cent. of sulphur.

Swedish Pyrites.—This is obtained in mining for copper ores, and is said to exist in enormous quantities, but at present the want of means of cheap transport to convenient shipping, prevents it coming into extensive use. A few cargoes, however, have found their way to Britain, and the ore itself has been found to work.

Belgian Pyrites.—Large quantities of this ore are imported, especially to the Tyne—the freight from Antwerp being very low, sometimes only 6d. per ton. The mines yielding it are in the districts of Liege and Namur, and are worked primarily for lead and zinc ores. One kind is called alluvial pyrites, and has the form of coprolites, and few of the pieces weigh more than a pound each. It burns well if used along with Norwegian or other ores. Another resembles a slag or cinder, and often contains

lead or antimony. Belgian ores contain from 40 to 50 per cent. of sulphur, and traces of thallium.

Westphalian Pyrites.—This resembles a very poor fire-clay, or shale, in appearance, but it burns well. It is said to contain a considerable quantity of thallium. The analysis gives 42 to 45 per cent. of sulphur-

Italian Pyrites.—Very little of this is imported, for although it contains about 45 per cent. of sulphur, it also contains 9 or 10 per cent. of silica, and its physical properties are not in its favor.

Irish Pyrites.—This is obtained from the Wicklow mines, where it occurs in beds of great thickness. It contains from 30 to 35 per cent. of sulphur. A deposit occurs in the Vale of Avoca which contains about 44 per cent. of sulphur.

Cornish Pyrites.—Under this head the author included the ore from the mining districts of Dorset, Devon and Cornwall. It is got in the dressing of the lead and copper ores, and usually contains from 25 to 30 per cent. of sulphur and 1 or 2 per cent. of copper, and frequently arsenic. The author also referred to the fact that Mr. Vivian is making sulphuric acid by burning copper pyrites in kilns of peculiar construction.

Coal Brasses.—This material, also called "Scotch gold," is largely used, and is a cheap source of sulphur for acid to be used in making manures, &c. Even when well cleaned it always contains organic matter, and possesses other disadvantages; still it is useful in keeping up heat in the kilns if used along with other varieties.

Cleveland Pyrites.—Although interesting to the geologist, this mineral is of little interest to chemical manufacturers, and the author said he only knew of one establishment where it is used—one near Middlesbro'-on-Tees.

The author concluded his paper by referring to the sulphur-recovery process, patented by M. Mond, and now being practically applied under his (the author's) care at St. Rollox Chemical Works.—*London Chem. News, May*, 8, 1868, from *Proc. Philos. Soc. Glasgow.*

OBSERVATIONS ON THE PRODUCTION OF NITRE IN INDIA.

By Dr. J. W. Palmer.

The native "sorawallahs" make it the business of their lives to search for saline incrustations in and around the mud walls which enclose the primitive dwellings of the inhabitants of the north-western provinces of India. When the appearance of the soil indicates the existence of nitre they scrape off a thin layer of the impregnated earth and lixiviate it in clay vessels, either with water alone or with the last washings of a previous operation, the solution thus obtained being poured into shallow pans of unglazed earthenware, and there left exposed to the sun and hot winds of a tropical climate, until the nitre crystallizes out. The crude product is then partially purified by being again dissolved and recrystalllzed. The saltpetre is recovered in the form of dingy prismatic crystals, and common salt to the amount of from one to nine per cent. is left in the mother liquors, which upon evaporation to dryness is recovered and separately collected. The sorawallah makes periodical visits, and secures fresh collections of nitre from the same spots of ground week after week, the rate of production remaining constant whilst the dwellings are inhabited, but decreasing gradually if from any cause the villages are deserted. The physical features of the nitre-producing regions were then described, and the author referred to the conditions under which most nitre seemed to be obtained; these were dependent upon the existence in the plains of India of a friable, nodular, calcareous rock called "kunkur," and water must not occur nearer the surface than twenty feet; but it was remarked that the largest yield of nitre was furnished in the four months of the year constituting the rainy season, the heavy tropical rains having the effect of washing the salt from the depths of the soil to the surface, rather than of dissolving it out entirely and carrying it into the rivers. The process of nitrification commenced with the conversion of urea, &c., into nitrate of lime, under the combined influences of heat, moisture, and of the before-mentioned calcareous rock; whilst the practice of the natives of throwing their wood ashes into the common drains supplied the carbonate of potash from which, by double decomposition, the

nitre was formed. These changes only occur in the neighborhood of villages, or densely populated localities, but the process of artificial generation of saltpetre had been successfully carried out in connection with the Indian jails. The author adds a speculation as to the influence of electrical agencies (thunderstorms) in contributing towards a more rapid formation of saltpetre.

The President, in proposing a vote of thanks to Dr. Palmer, invited discussion upon the electrical theory of the generation of nitric acid; whether, all other circumstances being the same, most nitre should be formed during the season in which thunderstorms were prevalent.

Mr. W. H. Perkin expressed his surprise in noticing how few sparks from a Rühmkorff coil sufficed to produce red fumes in a jar of air, especially if the temperature was somewhat raised, and the indigo test at once showed the presence of nitric acid.

Mr. David Forbes had had opportunities of studying the saltpetre manufacture in several parts of the world. In order to ensure a supply of saltpetre in case of war, in Sweden, every peasant was bound to supply a certain amount of nitre to the Government, as part payment of the taxes. It was the practice to rely upon wood ashes from the household fires as the source of potash, the other ingredients being nearly the same as in India, with lime added where it did not occur naturally. In the cold climate of that northern latitude there was no suspicion of lightning having any direct influence upon the generation of nitric acid. Spain formerly got much saltpetre from the plains of the south, where nitrogenous organic matter was somewhat scarce, but potash abundant, as the result of the decomposition of the felspar of the granites. In Peru, Chili, and other parts of the continent of South America, where rain *never* falls, immense accumulations of nitrate of soda were known to exist; in fact, it appeared only necessary to place organic matter in contact with carbonate of lime and common salt to secure the production of the nitrate of soda or Chilian saltpetre in that climate, and in these districts all the wells were so fully charged with saline matter, that it was necessary to procure water distilled from the sea with English coal, at the cost of £3 or £4 per ton, for ordi-

nary household use; even the locomotives on some South American lines had to be supplied with distilled water, to avoid the formation of saline crusts in the boilers.

Dr. J. H. Gilbert was led to believe that the process of nitrification was practically independent of the oxidation of atmospheric nitrogen or of electrical action; some years ago he searched for ammonia and nitric acid in rain water which fell during a heavy thunderstorm, and found ammonia without difficulty, but the quantity of nitric acid was excessively small.

Mr. John Williams took occasion to examine for *sulphuric* acid and ammonia in the rain water which fell during the thunderstorm in London about the end of May. The Nessler test immediately indicated the presence of ammonia, and the amount of sulphuric acid was by no means inconsiderable.

Dr. Hugo Muller said it was well known that organic matter containing but little nitrogen furnished nitrate as the result of its putrescence, and it had been hinted that the oxidation of these organic matters was capable of inducing (by a sort of catalytic action) the formation of nitric acid from the surrounding atmospheric nitrogen. Schönbien proved that nitric acid was formed merely by bringing nitrogen gas in contact with flame.

Dr. Guthrie was desirous of assuring himself that the proceeds of the sale of nitre more than covered the cost of production under favorable circumstances of native labor. Some years ago he proposed to the Government authorities to collect saltpetre in the Mauritius, for the town lies low and near the sea, and there were difficulties in the way of securing good drainage. Not only as a commercial speculation, but as a sanitary measure, the removal of this sewage, and the conversion of it, if possible, into saltpetre, seemed to be important. His advice was not adopted, and since that time his views had received confirmation by the fearful ravages of disease and high rate of mortality which had occurred in the island.

Dr. J. Attfield conceived that the largest production of nitre would not coincide with the periods when thunderstorms most frequently succeeded each other, but that a necessary interval must elapse to allow time for the oxidation to proceed.

Dr. Odling referred to an anomaly in the fact that starch

paste, although destitute of nitrogen, gave off ammonia during its fermentation. For his own information he enquired whether the great bulk of nitre imported from India is made by the manurial collection plan which had just now been described?

Dr. Palmer supplemented his previous remarks by making a few statements respecting the depth at which water ordinarily occurred in the large tracts of country near the Himalayas, as compared with other localities in the plains of the Ganges. There could be no doubt about the fact that nitre was collected in much greater quantity during the four months of the rainy season than at other times, but whether the circumstance was due to the more speedy recovery of the salt, already formed, by the solvent action of water resulting from heavy rains penetrating the earth to a greater depth, and by subsequent evaporation becoming reabsorbed to the surface; or to a direct influence of electrical action in promoting the nitrification, seemed to him (the speaker) well worthy of discussion, and he was only glad to have started a subject of so much interest to the members of the Society. For his own part he now thought that the lightning had very little influence in contributing to the formation of saltpetre. In reply to Dr. Odling he would state that all the saltpetre which came to England was the produce of the small collections brought in by the "Sorawallahs," who for centuries past and for many succeeding generations had carried on this business in the Bengal provinces.—*Lond. Chem. News*, July 3, 1868.

ON IODIDE OF STARCH.

By M. Guichard.

Since its discovery, the constitution of this body has been often discussed; according to some chemists it is only a mixture of iodine and starch, or starch tinted by iodine; others, on the contrary, consider iodide of starch to be a definite combination of iodine and starch, with excess of iodine. The general opinion is that the iodide of starch is a simple mixture, and the colorless iodide is only starch with hydriodic acid. M. Guichard thought that an examination with the dialyser would throw light upon the question. If there existed, in fact, a combination of iodine

and starch, the compound ought to be colloidal, and remain in the dialyser; if, on the contrary, only dissolved iodine and hydriodic acid were there, starch would alone remain. M. Guichard made a great number of experiments; he remarked that iodine passed the dialyser first, then hydriodic acid in large quantity; afterwards the iodide became suddenly decolorized, and later the iodine, as well as the hydriodic acid, ceased to be disengaged. When the experiment was made with iodide of starch decolorized by heat, the disengagement of iodine was difficult to perceive; that of hydriodic acid was alone observed; the same was the case with the iodide heated in close vessels for some hours to 100°, then to 150°. The colorless iodide of starch has then no existence; the so-called iodide of starch is simply starch tinted by iodine. Heat thus separates the iodine from the starch; the iodine then remains in the water, either as such or as hydriodic acid.—*Lond. Chem. News*, July 3, 1868.

RELATION OF THE CHEMICAL CONSTITUTION AND PHYSIOLOGICAL ACTION OF MEDICINE. ADDITION OF IODIDE OF METHYL TO VEGETABLE ALKALOIDS.

At one of the recent meetings of the Royal Society of Edinburgh, a very interesting paper was read by Drs. Crum, Brown and T. R. Fraser, upon the influence of direct chemical addition upon the physiological action of substances. This paper is the first of a series which may be expected to throw great light upon one of the most interesting questions which can suggest themselves, viz., the relation existing between the chemical constitution and the physiological action of medicinal and poisonous substances. That such a relation must exist, we can have no doubt; and, indeed, attempts have been made by some to establish the relation in certain cases. Hitherto, however, the subject has not received that systematic investigation which it is now receiving at the hands of the authors of the paper.

In order to arrive at any accurate knowledge as to the influence which chemical constitution exerts upon physiological action, it would appear to be desirable to take substances having a very definite and energetic physiological action, and then to perform upon them a chemical operation, having for its object

the promotion of a definite change in the constitution, and to examine the modification which the physiological action has undergone. Such has been the plan which the authors have pursued; the bodies which they have chosen for examination are the more active of the vegetable alkaloids, and the chemical operation, of which they have studied the effect, has been the direct addition of iodide of methyl. It was shown by How that, when iodide of methyl acts upon strychnia, brucia, morphia and other alkaloids, it adds itself to them, and beautiful crystalline bodies are produced which differ considerably in character from the salts of the alkaloids. The authors have already examined the physiological action of the bodies produced by the addition of iodide of methyl to strychnia, brucia, morphia, thebaia, codeia, and nicotia.

The iodide of methyl-strychnium is prepared by first treating finely pulverized strychnia with a solution of carbonate of potash in dilute alcohol, and then adding an excess of iodide of methyl mixed with about its own volume of rectified spirit, and digesting in a flask for twenty-four hours. The spirit is thereafter distilled off, the residue dissolved in water, and crystallized. It is well known that doses of strychnia, varying from one-twentieth to one-thirtieth of a grain, rapidly produced in rabbits most violent convulsions, and in a few minutes kill the animal; the phenomena produced being due to a localization of its action on the cord. It was found that twelve grains of iodide of methyl-strychnium, when administered (by subcutaneous injection) to rabbits weighing three pounds, produced no effect whatever. Fifteen grains produced symptoms, and twenty killed; but the animal died with symptoms altogether different from those produced by strychnia. In place of violent and spasmodic convulsions and muscular rigidity, the appearances were those of paralysis with complete general flaccidity. The spinal motor nerves were either paralyzed, or speedily become so; and, instead of the speedy occurrence of muscular rigidity, the muscles remained flaccid, contractile, and alkaline for several hours. In short, by the addition of iodide of methyl to strychnia, the toxic properties of the latter are diminished about 140 times; and the body produced possesses the physiological action of curare, viz., paralysis of the end-organs of the motor nerves.

Similarly, Brown and Fraser have discovered that the toxic properties of brucia, thebaia, and codeia are immensely diminished by the addition of methyl; and that the bodies produced, instead of being, as all three of these alkaloids are, strongly convulsent, possess, on the contrary, the physiological action of curare. Morphia, as is well known, possesses both soporific and convulsent properties; its toxic action is much diminished by the addition of iodide of methyl; its convulsent action is destroyed, but its soporific action remains. The above are amongst the chief results which have been obtained by the authors, and appeared to possess such interest as to warrant my drawing the attention of your readers to them.—*Chem. News, March*, 1868, from the *British Medical Journal.*

ACTION OF VERATRUM VIRIDE AND V. ALBUM.

Dr. Oulmont (*Neues Repertorium für Pharmacie*, 1868, Bd. xvii, Heft. 3, p. 177) publishes some interesting observations and experiments made on man, dogs, rabbits, and frogs, with veratrum viride. When small, non-fatal doses were given to the lower animals, the symptoms were localized chiefly in the digestive, respiratory, and circulatory symptoms, and on the general force. In the digestive system, they consisted of nausea, of vomiting, which sometimes lasted for twenty hours, and of diarrhœa. If doses sufficient to cause death were administered, these symptoms occurred in an excessive degree, but no signs of inflammation could be discovered. The respirations were powerfully affected at an early stage; they were sometimes unequal and irregular; they were sometimes diminisbed in number to two or even one in the minute; and in frogs they were sometimes altogether stopped. The rapidity of the circulation was soon diminished, the pulse being often reduced within fifteen minutes by from twenty to forty beats in the minute. The effect on the temperature was somewhat less marked. It falls two, three, or five degrees in from an hour and a half to two hours, and it may remain at this reduced point as long as twenty-four hours. The hyposthenic action is nearly immediately produced, and the weakness and sinking of the gene-

ral force are prominent effects of large doses; but even when these are sufficient to cause death, neither muscular stiffness nor convulsions ever occur. The latter symptoms, however, are the special characteristics of the action of veratria. For the purpose of comparison, Oulmont examined the action of veratrum album. He found that it is distinguished from that of V. viride by the greater violence of its effects on the digestive system, where it always produces inflammatory lesions, and by the greater rapidity of its action. Finally, the action of the alkaloid veratria, was investigated with the somewhat unexpected result, that it is not the true active principle of veratrum. Some V. viride was completely freed from the alkaloid, and an ordinary dose given to an animal; the effects were in all respects the same as those of the usual preparations. Oulmont concludes that veratrum viride is a cardiac poison analogous to digitalis, from which it is distinguished by its extraordinary rapidity of action. The investigation is of special interest as, until now, a considerable amount of uncertainty has existed as to its exact physiological action.—*Amer. Journ. Med. Sci., July*, 1868, from *Journ. Anat. and Phys., May*, 1868.

ON THE MEANS OF RECOGNIZING THE SOURCE OF AN ALCOHOL.

The source of an alcohol is usually ascertained by pouring a small quantity into the palm of the hand, and allowing it to evaporate; as the alcohol is more volatile than the empyreuma, the odor of the latter reveals the origin of the alcohol when the evaporation is almost terminated. But this process is very imperfect, as the alcohol may dissolve fatty substances from the hand, which will modify its odor. It is better to operate in a glass or porcelain capsule; but the following plan is still more safe:—Mix the alcohol with an equal quantity of ether, and then add a volume of water equal to that of the mixture. The ether dissolves the empyreuma, and carries it with it when separating with the rest of the liquid. Then evaporate this ether in a porcelain capsule, and the residue gives the empyreumatic odor so characteristic that it cannot be mistaken. Rum, arrack

cognac, potato, or wood spirit may thus be easily distinguished. The test only occupies a few minutes; but rectified ether must be employed, as common commercial ether also leaves an odorous residue on evaporation.—*Chem. News, June* 19, 1868, from *Neue Gewerbeblätter aus Kurhessen.*

OZONE.

Dr. H. Day, in a report on this article made to the St. Andrews Medical Graduates' Association, gives the conclusions at which he has arrived, the most important of which we subjoin:

There can be no escaping, at this moment, from the theory that ozone is a modified condition of oxygen, indeed, is oxygen plus force, which force is probably used in condensation—in other words, the power or capability of oxygen to combine with itself.

For the production of ozone in the laboratory, no method is so good as that accomplished by the aid of the induction coil. The production of ozone in the air, if it be there, is not yet in any way definitely understood.

The ordinary tests for ozone are imperfect, not because they will not prove the presence of ozone, but because they prove too much—that is to say, the presence of other bodies also common to the atmosphere.

In its action on the body the effects of ozone seem to be confined to the respiratory passages and structures; in fact, it is purely local in its action, resembling closely diluted chlorine and diluted bromine in vapor; the phenomena induced, varying in intensity, may be catarrhal, bronchial, or pneumonic, nor is there any evidence of any other class of diseases from ozone.

On dead matter, ozone exerts a powerful destructive action, resembling in this way chlorine, iodine, and especially bromine.

Ozone is a disinfectant and deodorizer belonging to those bodies which disinfect and deodorize by resolving and decomposing into primitive and innocuous forms, competing in this respect with substances already named—*i. e.*, chlorine, bromine, and iodine. It possesses these qualities in a less degree than chlorine and bromine, and is, in many cases, not so applicable as iodine.

As a preventive of disease, ozone can only act by destroying organic animal poisons, in which respect it may be compared with the substances I have more than once named. With regard to the disinfecting and deodorizing powers of ozone, I would refer you to the opinions of the late Dr. Barker, contained in the Hastings prize essay for 1865. The subject of comparison, and indeed the whole subject of deodorizing and disinfecting, is there so admirably, so exhaustively discussed, as to leave, it seems to me, nothing further to be said on the subject.

Lastly, as a remedy. In the form of ozonized oil, of ozonized ether, and ozonized water, it once more ranks with a similar combination of remedies, containing chlorine, bromine, and especially iodine. Whether, in any respect, it may prove to have greater advantages than the last named trusty and ready agent, can only be conclusively arrived at by determining whether it will do what iodine will *not* do, and this can only be decisively made out by applying to it the test of inductive philosophy—a rigid exclusion of all that is ineffective.—*Amer. Journ. Med. Sci., July*, 1868., from *Med. Press and Circular, Jan.* 15, 1868.

RELATIVE VALUES OF FRENCH AND ENGLISH WEIGHTS AND MEASURES.

By A. A. Fesquet.

I see in the column of Notes and Queries (American reprint, March, 1868) that one of your readers wishes some calculations showing the relative value of French and English weights and measures. Tables for this purpose are to be found in many technical works, but I think they are not so complete as those I join to this letter. You will see by the number of different values of the gramme, and of the carat weight, that "the doctors or the standards disagree."

The value I have adopted for the gramme is 15·438395 troy grains, calculated from 1 pound avoirdupois = 7000 grains = 453·4148 grammes.

It may be that these data, or my calculation, are incorrect; if so, I wish to be corrected. It would be a satisfaction to many

of your readers to know the exact value in grammes of the English standard pound avoirdupois, and how many troy grains it contains. Most authors say 7000 grains; however, I have seen 7004 grains printed somewhere.

The use of the metric system is extending more and more; but the abbreviations in writing are not always short and corresponding to the simplicity of the system, therefore I have added to the tables a series of symbols for abbreviations, which will be understood by looking at them. The system is based on the same principles followed in chemical symbols Each unit and its prefixes are indicated by their first letter, with this difference, that a capital letter is used when the prefixes are those increasing the unit.

We use already: kgm. = kilogrammetre; we might have as well, kg°. = kilogramme degrees, g = gramme, instead of gm. or grm.

Philadelphia, March 23, 1868.

TABLES

Showing the relative values of French and English Weights and Measures, &c.

MEASURES OF LENGTH.

Millimetre =	0·03937	inch	
Centimetre "	0·393708	"	
Decimetre "	3·937079	inches	
Metre "	39·37079	"	
" "	3·2808992	feet	
" "	1·093633	yard	
Decametre "	32·808992	feet	
Hectometre "	328·08992	"	
Kilometre "	3280·8992	"	
" "	1093·633	yards	
Myriametre "	10936·33	"	
" "	6·2138	miles	

Inch ($\frac{1}{36}$ yard) . . . . =	2·539954	centimetres	
Foot ($\frac{1}{3}$ yard) . . . . "	3·0479449	decimetres	
Yard . . . . . "	0·91438348	metre	
Fathom (2 yards) . . . . "	1·82876696	"	
Pole, or Perch (5½ yards) . . "	5·02911	"	
Furlong (220 yards) . . . "	201·16437	"	
Mile (1760 yards) . . . "	1609·3149	"	
Nautical mile . . . . "	1852	"	

Superficial Measures.

Square millimetre	=	$\frac{1}{645}$	of a square inch
" "	"	0·00155	" "
" centimetre	"	0·155086	" "
" decimetre	"	15·5086	" inches
" "	"	0·10769	" foot
" metre or centiare	"	1550·86	" inches
" "	"	10·7698	" feet
" "	"	1·196033	" yard
Are	"	1076·98	" feet
"	"	119·6033	" yards
"	"	0·098845	rood
Hectare	"	11960·33	" yards
"	"	2·471143	acres
Square inch	"	645·109201	sq. millimetres
" "	"	6·45109	" centimetres
" foot	"	9·2903	" decimetres
" yard	"	0·836097	" metre
" rod or perch	"	25·291939	" metres
Rood (1210 sq. yards)	"	10·116775	ares
Acre (4840 " ")	"	0·404671	hectare

Measures of Capacity.

Cubic millimetre	=	0·000061029	cubic inch
" centimetre, or millilitre	"	0·061029	" "
10 cubic centimetres, or centilitre	"	0·61029	" "
100 " " decilitre	"	6·10295	" inches
1000 " " litre	"	61·0295688	" "
" " " "	"	1·760773	imperial pint
" " " "	"	0·2200967	" gallon
Decalitre " "	"	610·295688	cubic inches
"	"	2·2009668	imp. gallons
Hectolitre	"	3·5317	cubic feet
"	"	22·009668	imp. gallons
Kilolitre or cubic metre, or stere,	"	1·308	cubic yard
" " "	"	35·3171	" feet
Myrialitre	"	353·171	" "

Cubic inch	= 16·3855	cubic centimetres
" foot	" 28·3159	" decimetres
" yard	" 0·764520696	" metre

American Measures.

Winchester, or U. S. gallon (231 cub. in.)	=	3·785085 litres
" " bushel (2150·42 ")	"	35·23603 "
Chaldron, (57·25 cubic feet)	"	1621·085 "

BRITISH IMPERIAL MEASURES.

Pint ($\frac{1}{8}$ gallon)	. =	0·567932	litre
Quart ($\frac{1}{4}$ ")	. "	1·135864	"
Imperial gallon	. "	4·54345797	litres
Peck (2 gallons)	. "	9·0869159	"
Bushel (8 gallons)	. "	36·347664	"
Sack (3 bushels)	. "	1·09043	hectolitre
Quarter (8 bushels)	. "	2·907813	hectolitres
Chaldron (12 sacks)	. "	13·08516	"

—*London Chemical News*, May 8, 1868.

PHYSIOLOGICAL ACTION OF THÉINE.

Chemical analysis has shown that tea contains the same crystallizable, nitrogenized principle as coffee and cocoa. Dr. Leven conceived that it would be useful to determine by experiments whether the physiological effects were the same. Having already experimented with caffeine (see Amer. Jour. Med. Sci. for April, 1868, p. 525), he determined to experiment with théine on frogs and guinea pigs. The following are his conclusions:—

1st. Théine and caffeine, considered as one and the same alkaloid by chemists, seem to produce different toxic effects on animals submitted to their action.

2d. Théine is a less powerful toxic than caffeine, and it is only when given in double doses that the former produces the toxic effects of the latter.

3d. Théine also produces convulsive movements in the limbs, which Dr. L. has not observed from the action of caffeine.

4th. In other respects their physiological effects are identical. Both alkaloids seem to directly excite the heart and respiratory movements and to increase arterial tension. By exciting the circulation, they stimulate the central nervous system, the brain and spinal marrow; but they do not arrest the functions of the spinal cord and nerves. The tetanic convulsions resulting from their action is caused by the stimulation of the spinal cord. They do not abolish the functions of muscle; the heart does not cease to beat immediately after death.—*Amer. Journ. Med. Sci., July*, 1868, from *Archives de Physiologie Normale et Pathologique*, May–June, 1868.

DETECTION OF NITROGLYCERIN.

By A. Werber.

To detect nitroglycerin in cases of poisoning, the author proceeds in the following manner:—The organic material to be tested is extracted with ether or chloroform, the extraction mixed on a watch glass, with two or three drops of pure aniline, and evaporated upon the water-bath. A few drops of concentrated sulphuric acid are then added, when, if nitroglycerin is present, a purple coloration appears which changes to a dark green on dilution with water. As little as ·001 grain of nitroglycerin may thus be identified.—*Lond. Chem. News, July* 10, 1868, from (*Schmidt's Jahrb. d. ges. Med.*, 1867, and *Zeitschr. Analyt. Chem.*, vii, 158.)

CARBOLATE OF QUINIA.

Prof. Wenzel, remarks (*Jahrbücher der Gesammten Med.*, Aug. 28, 1867), that carbolic acid, which in solution acts as a poison upon the lower animal organisms, is borne in proportionate, though large doses, by the higher animals and man, when introduced into the body in a diluted state. It was administered to some animals with advantage in their food in England at the time of the rinderpest. With bases, even weak ones such as quinia, carbolic acid loses in a great degree its irritating properties at the point where it is applied; when combined in the proportion of two equivalents of the acid to one of quinia, the compound is characterized by a slight sharpness, and a decidedly bitter taste. Professor Bernatzik proposes a preparation composed in this manner, and he hopes that it will prove an energetic disinfectant for internal use. G. Braun has given it with benefit in puerperal diseases, and Duchek in several typhous cases, and in one of pyæmia. Pills containing 1 grain of quinia with ·6 of a grain of carbolic acid were given repeatedly without causing the slightest inconvenience, and according to these statements 3 to 6 grains of carbolic acid were given daily without injury. The compound was prepared by dissolving 60 parts of carbolic acid with 100 of quinia, in 300 of highly rectified spirit, filtering the solution, distilling and evaporating to the consistence of turpentine, and then mixing some extract of acorus and powdered cassia.—*Amer. Jour. Med. Sci., July*, 1868.

PREPARATION OF LITMUS PAPER.

By A. Vacher.

I have had much trouble in obtaining a thoroughly satisfactory litmus paper. When used with blotting paper it is not as delicate as could be wished, and on one occasion, when attempting to make it with sized paper, the blue tincture persistently turned red when it touched the paper. The latter reaction seemed to be due to the sizing material, and it occurred to me that if I sized some paper myself with pure gelatin, my object would be obtained.

I can recommend the following receipt:

"Digest 20 grm. litmus with 100 c. c. water for some time, shaking occasionally; then filter. To the filtrate add a slight excess of nitric acid, and boil; then neutralize exactly with potash. Now make a weak solution of gelatin by boiling 1 part of isinglass with 50 parts of water; draw white blotting paper through this, and hang it up to dry. When dry, paint one side with the above solution of litmus.

20 Great Marlborough Street, May 30.

—*London Chem. News*, June 5, 1868.

ODORIFEROUS PRINCIPLE OF FLEUR DE GARANCE AND GARANCINE ALCOHOL.

It is a well known fact that when ground madder root is prepared into garancine, or fleur de garance, a saccharine liquor is obtained which, on fermentation and distillation, yields an alcohol which is contaminated with what, for years past, was considered to be methyl alcohol. More recent researches have brought out the fact that the peculiar odor of the alcohol obtained from the washing liquors of the garancine and fleur de garance works is due to acetic ether, and far more largely to aldehyd. The impure madder spirit, as ordinarily met with in trade, is an excellent source from which to prepare and obtain large quantities of aldehyd ammonia by the following method: From 20 to 30 litres of the impure spirit are placed in a distilling apparatus provided with a long metal (copper) worm, and heated to 60° or 70° C., while at the same time a rapid current

of air, or carbonic acid, is passed over the liquid in the still; the distillation is continued until the distillate ceases to give with solution of caustic potash a darkish coloration. To the distillate twice its bulk of water is added, while in order to decompose the acetic ether, finely powdered hydrate of baryta is added, with continuous agitation of the liquid until a decided alkaline reaction sets in; the excess of baryta is removed by carbonic acid. The aldehyd is afterwards separated from the liquid by careful distillation on a water bath, and purified by combining it with ammonia. If the impure madder spirit is agitated with sodium amalgam, perfectly pure alcohol is obtained; since the aldehyd is by this means hydrogenized to alcohol, and the acetic ether is decomposed into alcohol, while acetate of soda is formed. —*Lond. Chem. News*, June 26, 1868.

THE CICADA SEPTENDECIM.

During this month, (August,) the Seventeen-year Locust, (*Cicada septendecim* of Linnæus) has disappeared, and only a few Harvest-flies, as the two other species we have are called, raise their shrill cry during the dog-days. But as this year has been marked by the appearance of vast swarms in the Middle States, we cannot do better than give a brief summary of its history, which we condense from Dr. Harris' work.

The Seventeen-year Locust ranges from South-eastern and Western Massachusetts to Louisiana. Of its distribution west of the Mississippi Valley we have no accurate knowledge. In Southern Massachusetts they appear in oak forests about the middle of June. After pairing, the female, by means of her powerful ovipositor, bores a hole obliquely to the pith, and lays therein from ten to twenty slender white eggs, which are arranged in pairs, somewhat like the grains on an ear of wheat, and implanted in the limb. She thus oviposits several times in a twig, and passes from one to another, until she has laid four or five hundred eggs. After this she soon dies. The eggs hatch in about two weeks, though some observers state that they do not hatch for from forty to over fifty days after being laid. The active grubs are provided with three pairs of legs. After leaving

the egg they fall to the ground, burrow into it, seek the roots of plants whose juices they suck by means of their long beak. They sometimes attack the roots of fruit trees, such as the pear and apple. They live nearly seventeen years in the larva state, and then in the spring change to the pupa, which chiefly differs from the larva by having rudimentary wings. The damage the larvæ and pupæ do, then, consists in their sucking the sap from the roots of forest and, occasionally, fruit trees.

Regarding its appearance, Mr. L. B. Case writes us (June 15) from Richmond, Indiana: "Just now we are having a tremendous quantity of locusts in our forests and adjoining fields, and people are greatly alarmed by them; some say they are Egyptian locusts, etc. This morning they made a noise, in the woods about half a mile east of us, very much like the continuous sound of frogs in the early spring, or just before a storm at evening. It lasted from early in the morning until evening." Mr. V. T. Chambers writes us that it is abounding in the vicinity of Covington, Kentucky, "in common with a large portion of the Western country." He points out some variations in color from those described by Dr. Fitch, from New York, and states that those occurring in Kentucky are smaller than those of which the measurements are given by Dr. Fitch, and states that "these differences indicate that the groups, appearing in different parts of the country at intervals of seventeen years, are of different varieties." A careful comparison of large numbers collected from different broods, and different localities, and different years, would alone give the facts to decide this interesting point.

Regarding the question raised by Mr. Chambers, whether the sting of this insect is poisonous, and which he is inclined to believe to be in part true, we might say that naturalists generally believe it to be harmless. No hemiptera are known to be poisonous, that is, have a poison-gland connected with the sting like that of the bee, and careful dissections by the eminent French entomologist, Lacaze-Duthiers, of three European species of Cicada, have not revealed any poison apparatus at the base of the sting. Another proof that it does not pour poison into the wound made by the ovipositor is, that the twig thus pierced and wounded does not swell, as in the case of plants wounded by

Gall-flies, which secrete an irritating poison, giving rise to tumors of various shapes. Many insects sting without poisoning the wound; the bite of the mosquito, black-fly, flea, the bed-bug, and other hemipterous insects, are simply punctured wounds, and to a perfectly healthy constitution they are not poisonous, though they may grievously afflict many persons, causing the adjacent parts to swell, and in some weak constitutions induce severe sickness. Regarding this point, Mr. Chambers writes:

"I have heard—not through the papers—within a few days past of a child, within some twenty miles of this place, dying from the sting of a Cicada, but have not had an opportunity to inquire into the truth of the story, but the following you may rely on. A negro woman in the employment of A. V. Winston, Esq., at Burlington, Boone County, Ky., fifteen miles distant from here, went barefooted into his garden a few days since, and while there was stung or bitten in the foot by a Cicada. The foot immediately swelled to huge proportions, but by various applications the inflammation was allayed, and the woman recovered. Mr. Winston, who relates this, stands as high for intelligence and veracity as any one in this vicinity. I thought on first hearing the story, that probably the sting was by some other insect, but Mr. Winston says that he saw the Cicada. But perhaps this proves that the sting is *not* fatal; that depends on the subject. Some persons suffer terribly from the bite of a mosquito, while others scarcely feel them. The cuticle of a negro's foot is nearly impenetrable, and perhaps the sting would have been more dangerous in a more tender part."—*American Naturalist*, August, 1868.

ARE LOCUSTS POISONOUS?

We find a number of items in the newspapers this year claiming that locusts, their bite, sting, or eggs, are poisonous. In Georgia, it is stated that a young lady lost her life by rubbing her teeth with a twig (of *cornus Florida*, probably, as that is frequently done,) in which a locust had deposited its eggs. And somewhere in the west, fishes are said to have been poisoned by berries in which locusts had deposited their eggs, and which had

fallen into a stream. And the following items we find in the papers:

— Locust eggs appear to be very deadly in their poisonous effects. A party of little boys were recently killed by eating mulberries in which they had been deposited, and so rapid was the work of the poison, that they died under the trees from which they took the berries.

— The death of a little girl at Kimmswick, Mo., resulting from the sting of a locust, is noted by the local papers.

Now, "e'en from our boyish days," in the south and southwest, we were familiar with all kinds of locusts, handled and played with them constantly, and knew other children to do the same, and the worst thing we ever knew or heard about them was their intolerable music. This idea of their being poisonous, is a new one to us—but, then, this is Presidential year, and it may be that the locusts have become innoculated with the "poison of politics," hence the trouble!

If, however, the locust is really poisonous, it should be known, and our readers will confer a favor by reporting their observations on the subject.—*Editor Med. Surg. Rep., Aug.*, 1868.

OBSERVATIONS ON FERRIC HYDRATE.

By Professor Attfield, Ph.D.

In a memoir, noticed in the Chemical News of June 12th as having been recently presented to the Academy of Sciences, M. Jeannel, in allusion to the fact that ferric hydrate is not always soluble in acids, states that the incomplete solubility is, in his opinion, generally due to the influence of traces of sulphates. He says, according to the Paris correspondent of the Chemical News, "sesquioxide, precipitated from the persulphate, is always to a certain extent insoluble, or yields unstable salts; the same is the case with the sesquioxide precipitated from the perchloride, when this has been contaminated by sulphuric acid, or equally when the alkalies employed as precipitants have been so contaminated, or, finally, when the ferric hydrate, precipitated from pure solutions by pure alkalies, has been washed with common water." This explanation does not accord with my experience of the properties of ferric hydrate and oxyhydrates. Firstly, in Eng-

land the ferric citrates and tartrates used in medicine are successfully made in large quantities by dissolving ferric hydrate, prepared from ferric sulphate, in solutions of the respective acids and acid-salts. Secondly, I have frequently seen moist ferric hydrate perfectly dissolve in solutions of acids or acid-salts, even though the precipitate has been washed with common water containing sulphate of calcium,—a final washing with distilled water having, for various reasons, been neglected. Thirdly, I have often noticed that pure ferric hydrate, soluble when freshly precipitated, becomes imperfectly so if long kept, moist or dry. It is true that when alkali is added to solution of ferric sulphate, instead of the latter to the former, an insoluble oxysulphate is precipitated, and a similar compound may, possibly, be formed under other circumstances; but ferric hydrate, properly prepared and fairly washed, is readily soluble if only it be used in the moist and recently-precipitated condition, with a solution of acid or acid-salt which is not too weak, and the mixture be not boiled or even strongly heated for any considerable length of time. The fact is that ferric hydrate, even though kept under water, decomposes after a time, or more quickly if heated, losing the elements of water and becoming an oxyhydrate, a body insoluble in weak acids, and, also unlike ferric hydrate, incapable of acting as an antidote to arsenic, that is, incapable of forming ferrous arseniate.

It may be useful again to draw attention to the decided alteration in properties which ferric hydrate spontaneously undergoes when exposed beneath the surface of water* or when boiled with water, as evidence that this substance ($Fe_2 6HO$) is a true analogue of hydrate of sodium (NaHO), &c., and not a hydrous ferric oxide ($Fe_2O_3, 3H_2O$). It is more reasonable to suppose that in acquiring new properties ferric hydrate becomes changed to new compounds than to consider that the changes result from the loss of a portion of water already existing as water. Between ferric hydrate ($Fe_2 6HO$) and ferric oxide (Fe_2O_3) there would appear to be several oxyhydrates, analyses, &c., of most of which have al-

* [This fact was probably first noticed in April, 1842, in the American Journal of Pharmacy, by the Editor, and afterwards by Wittstein (*Buch. Repert.* xliii, 366.)]

ready been given in the Chemical News (xvii, 56) by Brush and Rodman.

1. Fe_4 12HO
2. Fe_4O 10HO
3. Fe_4O_2 8HO
4. Fe_4O_3 6HO
5. Fe_4O_4 4HO
6. Fe_4O_5 2HO
7. Fe_4O_6

In the above formulæ, No. 1 represents two molecules of ferric hydrate; Church found a stalactite of true ferric hydrate, native, in Cornwall, and Wittstein gives a similar formula to fresh artificial ferric hydrate. No. 2 is the only oxyhydrate, in this series, still unknown, unless, indeed, Haughton's Kilbride mineral contains this body. No. 3 is brown iron ore from the Hüttenrode Hartz. No. 4 is the formula of a limonite and of artificial ferric hydrate altered by age—described by Wittstein as having a crystalline structure. No. 5 is the mineral gothite, and also the dried oxyhydrate commonly used in pharmacy. No. 6 is turgite, hydro-hæmatite, or the mineral from Salisbury, Conn., analyzed by Brush and Rodman. No. 7 represents two molecules of ferric oxide.—*Lond. Chem. News*, June 26, 1868.

CHEMICAL RESEARCHES ON SUGAR REFINING.

By M. Emile Monnier.

If sulphurous acid gas is conducted into a chamber containing coarse sugar, the latter is promptly bleached, and about three-fourths of the coloring matter are entirely destroyed, whilst the sugar undergoes no change whatever in composition. After this treatment the sugar smells strongly of sulphurous acid, which presents no inconvenience in the process of refining. To bleach sugar in this manner, for 1000 parts by weight of sugar about four parts of sulphur must be burnt, and the gas conducted into the chamber. When the operation is once set going, the proportion of sulphur may be notably diminished. The sulphur is converted into gas by combustion in a little furnace placed at the side of the chamber. When the action is complete, the sugar is dissolved in water, and its sulphurous acid neutralized by a small

quantity of lime. This lime may be previously converted into sucrate of lime by M. Peligot's method, that is, by crushing it with a little syrup; for 1000 lbs. of sugar three or four pounds of lime are requisite in the form of sucrate.

M. Monnier has been at great trouble to ascertain whether the sulphurous acid gas thus used modified the sugar so as to produce a certain amount of grape or non-crystallizable sugar, and he has convinced himself that sugar bleached in this manner undergoes no change whatever. The quantity of non-crystallizable sugar found by analysis after the operation in question was, in each case, exactly equal to the amount which the sugar contained before being bleached: namely, on the average, about 2·15 per ct. In all these experiments the sugar was exposed about forty-eight hours to the bleaching action.

The above process gives most striking results with exotic sugars, which are highly colored; with lighter colored samples, the bleaching is not so marked; but in the former case, two-thirds to three-fourths of the heterogeneous coloring matters are eliminated completely.—*Lond. Chem. News*, May 15, 1868.

POISONING BY PHOSPHORUS.

M. Mialhe, having been lately engaged in a medico-legal investigation on a case of poisoning by phosphorus, was led during the experiments he performed, to alter his views in relation to the absorption of this substance. Until now he had thought the absorption of sulphur and phosphorus was solely due to the chemical action of the alkalies present in the intestinal juices. This investigation, the result of which he now details (*Union Méd.*, June 4), has convinced him that such absorption is especially due to the fatty matters contained in the alimentary substances. These fatty matters, after affecting the solution of the sulphur and phosphorus, serve as the vehicle for their introduction into the economy. It is even probable, at all events as regards phosphorus, that their absorption as a simple body is the general rule, absorption in consequence of chemical reaction being the exception. The proof that such is the case in poisoning by phosphorus is, that while abstinence and the

taking emollient or acidulated drinks have apparently led to a cure, the ingestion of alimentary matters develops all the symptoms of poisoning, the patient usually dying. The phosphorus so absorbed may remain several days within the economy without undergoing any sensible change, its union with the fatty matters enabling it in great part to escape the action of the chemical agents with which it comes in contact, and to thus diffuse itself through all the living tissues in the same manner as poisons soluble in water. This explains why, when we perform the autopsy in the dark, of an animal that has been poisoned by phosphorus, its tissues give out the phosphorescent light and aliaceous smell. It also explains why some persons have been poisoned after eating the flesh of domestic animals, such as fowls or pigs, which have eaten phosphoric paste. We can, then, adopt M. Tardieu's statement that phosphorus is poisonous of itself, and acts only on the economy in a state of isolation and purity. The extremely poisonous character of phosphuretted hydrogen presents no objection to this theory, since instantly that this is introduced into the blood it gives rise to the production of water and the precipitation of phosphorus in a state of minute division eminently suited for the development of its deleterious action.

Two practical consequences are deducible from what precedes. First, in poisoning by phosphorus it is indispensable to expel this toxical agent as rapidly as possible from the economy by aid of acidulated laxative drinks, and to place the patient in a state of abstinence, or at all events prohibit his taking any food containing fatty matter; and secondly, that when phosphorus is administered therapeutically it is best to give it dissolved in a heated fatty body, which prevents its undergoing change, and insures its complete absorption. Acting in this way, we avoid entirely the local action of the phosphorus, which is not the case when it is prescribed dissolved in ether or chloroform. These two substances being soluble in a large quantity of water, the whole or part of the phosphorus is set at liberty by the alimentary fluids, and, becoming deposited on the mucous membrane, gives rise there to more or less inflammatory action.—*Med. Times and Gaz.*, June 13, 1868, in *Med. News*, Aug., 1868.

AN ATTEMPT TO ANSWER THE QUESTION: WHICH PART OF THE PLANT CONIUM MACULATUM IS THE BEST FOR MEDICINAL USE?

By Wm. Manlius Smith, M.D., Manlius, N. Y.

[Note.—Last year we published the statements of Dr. Harley, of London, in relation to the Conium of England, and it is but proper to give place to the report of Dr. Smith, who is a careful and qualified experimenter. It is to be regretted that a remedy so much used should be so variable. We have known two-grain pills of Tilden & Co.'s "Ext. Conii," U.S.P., to be returned because of their excessive activity, the patient supposing that an error had been made; and formerly, when illustrating the chemistry of Conium, we used a specimen of Thayer's fluid extract, as being particularly good. The great importance of uniformity in the strength of medicines of this class should cause manufacturers to carefully seek out all causes of variation, and avoid them. Immature plants, those that are too old, and those that have become altered by the fermentative action arising from the green plant lying in heaps, preparatory to pressing it. It is well known that most of the Conium used by the extract makers is of spontaneous growth, along roadsides and near dwellings, and that often many hours, if not a day or two, elapses between the gathering and pressing. Now it is quite probable that much of the conium may be more or less injured by this fermentation, according to the extent it has advanced; and as it is not probable that the injured plant is rejected, it is to be feared that much inferior Conium enters the preparations of commerce. Formerly, when alcohol was cheap, we believe Tilden & Co. used to sprinkle the recent herbs with it, with a view to retard decomposition. They formerly added alcohol to the marc before pressing, for similar reasons, and to favor the extraction of the juice. We do not know what the present custom is. So long as the business of making narcotic and other extracts from green plants is consigned to these large operators, it is very needful that they should use every precaution to guard against deteriorating causes.—Editor Am. J. Pharm.]

If we place any confidence in the maxim, "*Ubi virus, ibi virtus*," we should expect to find in Conium maculatum a valuable medicinal agent; for, since the days of Socrates, it has been known that the hemlock in efficient quantities is capable of destroying life. But if we are to judge of its value by the degree of use commonly made of it by medical men, we can assign it only an inferior rank in the materia medica.

If we reflect, however, that the disuse into which Conium has fallen may have arisen from the circumstance that the preparations of it attainable by physicians vary more in quality than

those of most other medicinal substances, and that frequently these preparations are totally destitute of activity, we may think it worth our while to inquire if there is not some means by which such a degree of uniformity and stability can be given them as to render them worthy of the confidence and reliance of the medical profession.

It was with a view of fixing upon some good plan for securing this result, and also with the hope of adding, perhaps, something to the general stock of knowledge with regard to the therapeutic uses of the article, that the subject of Conium was accepted by the writer for examination. In the outset of the investigation, the fact presented itself that pharmacopœias differ as to the part of the plant recommended for medicinal use, the U. S. Pharmacopœia directing the leaves, and the British the fruits or seeds. From all that could be gathered from the ordinary treatises on materia medica, it would seem that the seeds are the most active, but how much more energetic is not specified.

The first thing in order, then, seemed to be to settle by some precise and accurate experiments the difference, if any, existing in different parts of the plant as respects their activity. As the medicinal efficacy of Conium is believed to reside in the alkaloid, or alkaloids existing in it, the method of ascertaining the comparative quantities of these alkaloids that are contained in different parts of the plant, presented itself as an available one for the purpose in view.

The plan adopted has been to make, as nearly as possible, precisely similar preparations from the leaves collected at two different stages of growth, and from the seeds at different degrees of maturity, and then by a delicate re-agent to test their comparative richness in the alkaloids. The re-agent used was that recommended by F. F. Mayer, in the American Journal of Pharmacy, vol. xxxv, p. 23, consisting of a dilute solution of iodide of potassium and corrosive sublimate in water. As comparative results only were aimed at, the following modification of the course of proceeding prescribed by Mayer was adopted: The various solutions to be tested were each diluted with carefully ascertained amounts of water, till but a faintly perceptible turbidity was produced on the addition of the test liquid, and

the comparative strengths estimated by the amount of dilution that each solution admitted of.

The 30th of July, 1866, a quantity of leaves was collected from a Conium plant just fairly in flower. All withered and sickly looking portions, as well as the greater part of the petioles, both general and partial, having been rejected, four parcels of 500 grains each were accurately weighed out, and designated A^1, A^2, A^3 and A^4. Of these, A^3 and A^4 were each thoroughly bruised in a mortar for five minutes, and then transferred to a half pint bottle, and 1000 grains, by weight, of diluted alcohol added. The mortar was well cleansed and dried between each operation. Parcels A^1 and A^2 were placed to dry, thinly spread out on paper, in a darkened room, and occasionally turned. The bottles containing A^3 and A^4 were well stopped with corks, covered with thick paper and placed in a cellar.

The same day, the leaves were collected from other plants wholly out of flower, and having the fruits on the more mature umbels nearly, if not quite, full grown. These leaves, the same care being used to reject inferior portions, were likewise weighed into parcels of 500 grains each, and designated B^1, B^2, B^3 and B^4, and were treated exactly as the corresponding parcels designated A.

The fruits that appeared to be full grown were collected from the same plants that furnished the leaves designated B, by cutting off with scissors the umbellules entire. Four parcels of 500 grains each were made of them, designated C^1, C^2, C^3 and C^4, which were treated as parcels A and B had been.

The partly grown fruits from the same plants furnishing B and C, consisting of those which had but just dropped the flower, and those that were about half grown, situated, as they were, on the same umbellules, were collected, by cutting off the umbellules entire, and four parcels of 500 grains each made and treated as before. They were designated D^1, D^2, D^3 and D^4.

On the 3d of August those parcels that had been placed to dry were weighed, and on the 23d of August were weighed again. The weights being essentially the same in both instances, it was concluded that the drying process had reached its limit. The several parcels weighed as follows: A^1 113 grains, A^2 110 grains,

B^1 158 grains, B^2 159 grains, C^1 and C^2 each 183 grains, D^1 185¼ grains, and D^2 183 grains.

A^2 (that is, the dried leaves from the plant in full flower) was pounded in a mortar till the powder all passed through a sieve of 37 meshes to the linear inch. In this operation it lost four grains. The remaining 106 grains were placed in a half pint bottle, and 390 grains of water and 1000 grains of diluted alcohol added. The object of adding the water was to make the menstruum used, in effect, the same as that in which A^3 and A^4 had been put to macerate. Parcel A^1 was wrapped up, first in writing paper and then in thick brown paper, and laid on a shelf, for examination after a time sufficiently long to test its keeping properties.

B^2, or the leaves from the plants wholly out of flower, were treated in the same way that A^2 had been, except that 341 grains of water only were needed to supply that lost in the drying process. Parcel B^1 was treated as A^1, as were also C^1 and D^1. C^2, or the full grown but unripe and green fruits or seeds, was powdered till 160 grains passed through the sieve. The remainder, consisting mainly of pedicels, weighed 20 grains. Both the 160 grains of powder and the 20 grains of pedicels were placed in a half pint bottle, and 320 grains of water and 1000 grains of diluted alcohol added. D^2, or the full grown seeds, gave a weight in powder and pedicels of 177½ grains, and was treated with 320 grains of water and 1000 grains of diluted alcohol. All the bottles, as before, were wrapped in brown paper and placed in the cellar. There they remained till January 18th, 1867, when tinctures were made from each lot by percolation; a funnel, with the throat so obstructed with flax as to deliver a drop about once a minute, being used as a percolator. A^3 was first placed in the funnel, and diluted alcohol poured on till a little over four ounces of liquid had passed,—that is, till the four-ounce vial used as a receiver was filled to a mark on its neck. The tincture obtained was then transferred to the bottle in which the leaves had macerated, it having been thoroughly washed and dried—the exhausted matter removed from the funnel—the funnel well rinsed and wiped, and half an ounce of diluted alcohol passed through to rinse out the obstructing plug, before B^3 was intro-

duced. In like manner B^3, C^3, D^3, and A^2, B^2, C^2 and D^2 were treated, the funnel being carefully cleansed between the percolations of the several parcels. The same amount of tincture was thus obtained from each, made, as nearly as possible, with the same menstruum.

In order to apply the re-agent selected, it was next necessary to get rid of the alcohol in the specimens to be tested. A certain definite and equal portion of each (20 cubic centimetres, or between 5 and 6 fluid drachms) was taken, the same amount of a watery solution of oxalic acid added to each portion of tincture taken, which was then evaporated by a gentle heat, not rising above 110° F., to approaching dryness. The residues were then diluted with water to the original volume of 20 c. c. each, and afterwards still further diluted, as occasion required, till they each were affected to the same faint degree of turbidity, by the application of the test liquid. It was found that the liquid from the leaves of the plant, just in full flower, admitted of a dilution with $1\frac{1}{2}$ times its volume of water. That from the leaves from the plant gone to seed bore but $\frac{1}{4}$ its volume of water; that from the full grown seeds required dilution with 7 volumes of water, and that from the immature seeds gave a perceptible turbidity with the test liquid when diluted with 8 times its volume of water, making the comparative strengths, in the active principle, as follows: $A_3=10$, $B_3=5$; $C_3=32$, and $D_3=36$. These experiments showed the partly grown fruits to be the most active portion of the plant. The tinctures made from the several parcels of leaves and seeds after drying, gave very unexpectedly the same figures, with the corresponding tinctures made from the undried specimens; from which results the inference was drawn that the method of drying adopted, had not dissipated any of the active principle.

Some full grown fruits, collected in August 1859, dried in a darkened room and kept in a paper package on a shelf, exposed to the ordinary changes of temperature, from changes in the seasons, were also examined. A quantity of them were powdered till they passed through the sieve of 37 meshes to the inch, and 177 grains of the powder, corresponding with the amount of powder of seeds used in the previous experiments

taken, moistened with water acidulated with oxalic acid, placed in a conical percolator, and water poured on till the same amount of liquid was obtained, as in the previous experiments. This solution was found to bear dilution with 7 volumes of water before reaching the limit of perceptible reaction with the test liquid. This seems to indicate that the dried seeds retain their activity unimpaired for upwards of seven years. But it should be borne in mind that as the summers of 1859 and 1866 probably differed in temperature, so the plants grown in those years may have differed in their original content of the active alkaloids.

Specimens of Fluid Extract of Conium, (U.S.P.), (that is, of dried leaves), prepared by Dr. E. R. Squibb, and also of Fluid Extract of Conium Seed, prepared by the same hands from the dried, full grown, but green fruits, were also tested in the way narrated above, the same amounts, 20 c. c., being operated on. The results obtained were, that the oxalic solution prepared from the fluid extract of the leaves bore dilution with 32 volumes of water, while that from the fluid extract of the seed bore dilution with 224 volumes of water, making the seeds in this case seven times as strong as the leaves.

It may be a matter of interest to state further, that a Fluid Extract of Conium bearing the label of Tilden & Co., and one with the label of Henry Thayer & Co., were also tested in the same manner. By this method the solution from Tilden's extract bore dilution with but $2\frac{1}{2}$ volumes of water, while that from Thayer's gave no reaction, even when undiluted. Some further investigation showed that this want of reaction was due, perhaps, to the presence of acetic acid, and so a modified form of the operation was tried with the three fluid extracts, i.e., Squibb's, Tilden's and Thayer's. The oxalic solutions obtained, 20 c. c. of the fluid extracts, were treated with solution of caustic soda till they gave decided alkaline reactions. They were then shaken in closed vials with about three times their bulk of ether, added in four successive portions, and the ethereal portion decanted and evaporated in contact with water acidulated with oxalic acid. The same bulks of etherial solution were obtained in each case, and the same amounts of the same strength of acidulated

water used. The residues obtained were diluted to the same extent, and the farther dilution they would bear tested with the re-agent before mentioned. In this series of experiments, Squibb's fluid extract (of leaves) gave a solution bearing dilution with 20 times its volume of water, Tilden's 1½ times its volume, and Thayer's 4 times its volume, making the comparative strengths of Squibb's 42, Tilden's 5, and Thayer's 10.

Some fluid extract made from the fresh fruits of conium in 1854, in such a manner that a minim of the liquid represented a grain of the undried seeds, was also tested. The oxalic solution was found to bear dilution with 19 times its volume of water. If we suppose the seeds from which this preparation was made in 1854 to have been of equal strength with those gathered in 1866, it will follow that this preparation, after the lapse of 13 years, still retained about two-thirds of its original efficacy. But, of course no reliable inferences can be drawn from a mere supposition.

The only experiment yet made by the writer, in the investigation in progress, to test the therapeutic effects of the conium, consisted in his swallowing 16 minims of Squibb's fluid extract of conium seed, with a view of arriving at some idea of the suitable medicinal dose. The quantity mentioned, taken about five hours after breakfast, produced marked operative effects in about twenty minutes. The effects manifested were a peculiar sensation of heaviness in the eyelids and, as it seemed, some degree of ptosis, and a feeling akin to dizziness, that made it quite unpleasant to retain a sitting posture. There appeared to be no disposition to sleep produced. The effects were at their height in about an hour, and mainly passed away after the lapse of two hours from the time of taking the dose. A moderate meal had been eaten in the interval.

This experiment would indicate a suitable *commencing* dose of the fluid extract above mentioned, to be about five minims.

What appears to have been arrived at by the experiment narrated is this: That the immature fruits of conium are far preferable to the leaves, that they may be dried without serious injury, and that a very active preparation may be made from them. The further course of this investigation, it is designed

to direct toward ascertaining, if possible, some of the causes producing the want of uniformity and stability desirable in the preparation of Conium, with a view of obviating them, if it may be, and also toward obtaining such experimental knowledge of the physiological and theurapeutic effects of the article in question as shall lead to additional practical applications of it.

MANLIUS, N. Y., *February* 4, 1867.

—*Trans. N. Y. State Med. Soc.*, 1867.

List of the Contributors to the Building Fund for the new Hall of the Philadelphia College of Pharmacy. (*Continued from Page* 377.)

Robert C. Brodie	$25 00	Wilson & Jones	$20 00
Tilden & Co., Lebanon, N.Y.	100 00		
Charles Ellis,	250 00	Since July	$605 00
Merrihew & Son	100 00	Previously	$4666 50
P. F. Lehlbach, N. Y.	10 00		
Edward Parrish	100 00	Total contributions	$5271 50

NOTICE.

American Pharmaceutical Association.

The sixteenth annual meeting of the American Pharmaceutical Association will be held in the city of Philadelphia, on the second Tuesday (the 8th day) of September, 1868, at 3 o'clock, P. M., at the new Hall of the College of Pharmacy, Tenth above Cherry Street.

It is confidently expected that the various standing committees through their chairmen, will be prepared in time to furnish the Association with full and highly instructive reports on the many interesting subjects which should occupy our earnest attention.

The objects of the Association and qualifications for membership are set forth in Articles I and II, Section I, of the Constitution.

Those desiring to join are requested to apply for blank applications to the Chairman of the Executive Committee, Thos. S. Wiegand, N. E. cor. 6th and Arch Sts., Philad., or to the Permanent Secretary, John M. Maisch, 1607 Ridge Avenue, Philad.

JOHN MILHAU, *President.*

New York, June 9th, 1868.

Exhibition connected with the 16th Annual Meeting of the American Pharmaceutical Association.

The Committee of Arrangements propose to have an exhibition of articles connected with the drug business, including chemicals, drugs, pharmaceutical preparations, apparatus, books, and miscellaneous arti-

cles. Those members of the Association and others wishing to contribute to the display will please address a note to William C. Bakes, 800 Arch St., chairman of the sub-committee on exhibition, stating the character of the articles they propose exhibiting. All articles should be delivered free of expense at the Hall of the Philadelphia College of Pharmacy, Tenth St. above Cherry, between the 1st and 5th of September, 1868.

Strangers arriving in Philadelphia to attend the meeting will find a committee of reception at the Continental Hotel, and information may be had from the Chairman and other members of the committee.

Alfred B. Taylor, 1015 Chestnut St.,
William Procter, Jr., 500 S. 9th St.,
Prof. Edward Parrish, 800 Arch St.,
James T. Shinn, Broad and Spruce Sts.,
Charles Bullock, 6th and Arch Sts.,
William C. Bakes, 800 Arch St.

Editorial Department.

Meeting of the Association.—The 8th of September is near at hand, and we look forward to a large gathering of the brethren in Pharmacy. There is every reason to believe that the Hall can be used for the purposes of the Convention. Let all come that can, and bring with them papers and subjects for discussion, and objects of interest for the exhibition. Those that can't come let them send a contribution in the form of papers or objects relating to pharmacy, so that we may have a good meeting, interesting to those present, and useful through the published proceedings to those who remain at home. It is the earnest wish of our College Members that all who get here may enjoy the visit and return home safely, profited by the occasion.

New Hall of Pharmacy.—Since our July issue, now about six weeks, very rapid progress has been made with the new Hall of the College of Pharmacy, and the lower rooms will be sufficiently completed in time to serve the purposes of the meeting of the American Pharmaceutical Association on the 8th of September. The Committee have urged on the work through the contractor, who has been indefatigable in his duties, and so far the weather has proved favorable. The Committee now feel the necessity of a more earnest action of the friends of the College at home and beyond our city in relation to the funds necessary to complete the building. The sale of the old building on Zane Street, though far short of the amount required, placed in the hands of the Committee a sum sufficient to encourage the hope that the deficiency could be supplied by the contributions of those interested in the profession and practice of Pharmacy, and its kindred pursuits. The readers

of the *Journal* will perceive, by the published list for July and that in the present number, that many of the subscriptions have been paid, while many others who have subscribed to the object will be prepared to make payment before the close of the year. Notwithstanding this, however, we are informed by the Treasurer that ten thousand dollars will be required to enable the Committee to meet the contract for the building, besides the necessary furniture and apparatus to adapt it to the purpose intended. The cash on hand is now nearly exhausted, and the Committee who have the matter in charge would respectfully urge upon the contributors to forward to the Treasurer the amounts subscribed, and would also earnestly ask all interested in the progress of Pharmacy to lend their aid to the object, so that the Philadelphia College of Pharmacy may keep pace with kindred institutions, and reflect credit on the honorable profession which it is designed to foster.

We have been hoping that our Graduates scattered over the country would feel disposed to remember their Alma Mater, and, without injuring their own interests, contribute materially to aid the Committee in meeting their engagements. The Treasurer recently received a contribution from a graduate of the College, in New York, accompanied by a note about as follows:—

"Enclosed please find a money order for ten dollars, as a contribution towards the building fund of the Old Alma Mater. If all her sons will remember the benefits they have derived from her, they will certainly be prompted to contribute their share towards her improvement.

A Graduate of 1863."

We also observe the names of our old friends Tilden & Co. on the list, and hoping that others at a distance will respond to the call and help the Committee onward, we leave the matter with our readers.

The American Journal of Pharmacy.—It is not often that we choose this text, being disposed to let the Journal get along on its own merits, but at this juncture we feel much impressed with the importance of what we are about to say. *First*, then, in reference to the scientific or professional support which should be contributed to its pages by the large number of members of the College and Graduates of the School of Pharmacy. Since the war the current of interest then turned aside from nearly all scientific objects has not returned to its old channels, and all seem engaged in the active pursuit of "business," without any disposition to step aside for a moment and record new ideas that may be suggested in the laboratory or at the dispensing counter for the benefit of the profession at large. We have never had so many subscribers as at present, and yet our list of active contributors is far too small. There are many respectable observers in our ranks whose observations would be very useful to their brethren, if published, yet who refrain from printing from a false idea of the importance of the subjects, together with an incorrect view of the length and style of the papers themselves. No matter how few words will convey the idea—half a page or a page will

be acceptable, and will often contain more valuable facts than longer essays. Among the subjects just now which particularly appeal to all of us, and which very many may contribute to throw light upon, are the preparations of the Pharmacopœia, to be criticised with a view to the Revision of 1870, and the United States Dispensatory, which is now being revised. Notwithstanding the improvements embodied in the Pharmacopœia of 1860, there are many points which need retouching, and now is the time for suggestional criticism, to bring out as far as possible the real defects that may exist in that work. In regard to the Dispensatory, suggestions conceived in a friendly spirit, in reference to additions needed, or existing items requiring modification, would be kindly received.

The *second* point is, that the necessity we are under to "pay the printer," requires us to urge our delinquent subscribers to pay their dues. This Journal has never been conducted in the spirit of money making; for a large part of its existence it was self-supporting; but since the prices for paper and labor have permanently advanced, it has become a burthen to the College, to a small amount, mainly, however, because the dues are not regularly paid by many, and only at long intervals if at all by others. If our *contributors* would become more active our *subscribers* would have an additional inducement to be prompt.

PHYSICIANS PRESCRIPTIONS; THEIR REPETITION WITHOUT AUTHORITY, AND THE MUTUAL RELATIONS OF PHYSICIANS AND PHARMACEUTISTS.—Within a year or two past several of the medical journals have contained articles in relation to the renewal of prescriptions by apothecaries, written from various standpoints, and medical societies have passed resolutions bearing upon the subject, sometimes not couched in language calculated to promote the object in view. The functions of the physician and the pharmaceutist are distinct and should be kept separate, yet the more harmony of action that can be maintained between them the better for each and for the communities who are to receive their services. Our attention has been attracted to this subject by a letter, signed John Ordronaux, addressed to Dr. Shrady, Editor of the New York *Medical Record* for August 15th. When propositions like those of Prof. Ordronaux are offered as a remedy for the presumed ill effects of renewing prescriptions, there is but little hope of any such harmonious action. If it were possible for apothecaries to carry out the wishes of the Professor to the letter, it would produce a feeling of indignation in the community that would properly vent itself on physicians themselves when its nature become understood. That such a law, if enacted, should be carried out literally, without injury to the public interests, would require a regularity of action and a continuity of attention to business on the part of physicians, that would be almost superhuman. Such a law, to be effective, would have to be equally binding on physicians and apothecaries, and any ill consequences from the refusal of an apothecary to fill a prescription for an urgent case, for which the neglect or forgetfulness of a physi-

cian had left unprovided by "an order for renewal," would have to be borne by the physician. In fact, any legislator would be delinquent in duty to his constituents who did not frame the law so as to exact from the writer of a prescription made non-renewable an equal penalty for neglect of duty in case the patient suffered from the want of medicine thus withheld from him. We believe that measures such as those proposed by Prof. Ordronaux would be much better substituted by others tending to raise the educational status of the mass of both medical and pharmaceutical practitioners, by requiring a legal certificate of qualification from all persons engaged in the prescribing and dispensing of medicines. When a glance is taken over our large cities at the host of medical and pharmaceutical pretenders who flourish undisturbed in their abnormal functions, not to speak of the numerous instances of *authorized* practitioners in both professions whom nature never intended for the life and death responsibilities attendent on the prescribing and dispensing of medicines, we believe there are much more worthy objects for the reformatory action of our medical brethren, whether in their individual or collective capacity, than are embraced in the prevention of apothecaries from renewing their prescriptions for patients whom they are not willing to trust with the responsibility of obeying their directions. As regards the "proprietary right of physicians in their own prescriptions," we doubt the existence of any such right outside of the law of copy-right—which merely applies to publication. The moment a prescription is published to the world, the world will use it if valuable, and the only way to prevent this result is for the physician to relapse into the habits of his predecessor of the middle ages, and concoct in the secret recesses of *his own laboratory* the prescriptions for his patients, a fate to which we earnestly trust he may never be submitted, as it would sound the death knell to all liberalism in medicine and pharmacy. With these preliminary remarks we offer the Professor's letter in full, as well that our pharmaceutical brethren in New York should be advised of what is in store for them, should he convince the wise men of Albany of the value of his remedy, as because in the first part there is some really good advice to physicians regarding the manner of writing and issuing prescriptions, of which we cordially approve.

To the Editor of the Medical Record.

SIR—At the last meeting of the New York State Medical Society, Dr. John P. Gray, as President, called attention, in his introductory discourse, to the necessity of some legislation upon the subject of the indiscriminate sale of medicines by incompetent apothecaries; as also of drugs calculated to produce abortion, though advertised with an ironical caution against their use, intended to mask in a legal way their predetermined purpose. Of the wisdom and justice of Dr. Gray's suggestions none can entertain any doubt, nor does the subject deserve less consideration because of its frequent mention heretofore in various medical assemblages, both local as well as national. It is one which appeals to the best interests of society in the future, as well as in the present, and should be recognized by legislators as forming part of that great department of the common weal known as State Medicine. Whatever legal

reforms may flow from such well-timed and apposite council as that given by the distinguished President of our State Medical Society, whether they be immediate or remote, all will agree that in the frequent ventilation of a great source of wrong-doing, other topics germane in character, if not of direct consanguinity, are invariably dragged into the light of observation, and placed beneath the eye of criticism, so as to secure ultimately some minor good in various directions, even though the parent evil should continue to resist the vigorous assaults of a scientific siege. It is through this law of association that the attention of the profession has of late been called to a great and growing evil committed by apothecaries, probably without intention of wrong doing, and yet militating seriously against the rights of medical practitioners, *in renewing prescriptions without permission of their authors first had and obtained.* The subject has been largely discussed in England; and in our own Academy of Medicine has given occasion to the passage of some very significant resolutions. But, as something more than resolutions is needed to give a definite solution to the question, I venture to offer the following suggestions as the readiest road to a permanent remedy.

The wrong alluded to, though practically committed by the apothecary, has its foundation in a different cause than the mere pharmaceutical incompetency of, or the negligent disregard of, another's rights by the dispenser of drugs. However true it may be, it is still painful to be compelled to admit that the blame should often be divided between the apothecary and the physician himself. And, as we pursue the inquiry, we shall see that the remedy has always lain within easy reach of the medical practitioner, who, having too often been negligent of duty to himself, expects another person, and in a different calling, to repair that negligence. Is this reasonable? We think not. As a presumption in law founded upon the habitual conduct of rational beings, every man is supposed to be watchful of his own rights, whether those rights are associated with life, health, reputation, or property. But if he slumbers upon them, so as to invite, if not permit, another to encroach upon their limits, he cannot avoid dividing the responsibility for his own injury with him who may have been the instrument for inflicting it. That this is the view which should be taken, in most instances, of the subject-matter now under discussion, will appear by a more critical investigation of the principles underlying the tri-partite relations of physicians, patient, and apothecary. If it can be shown, as is easily demonstrable, that the physician, in giving a prescription, has a duty to discharge to himself, as well as to the patient who employs him, and that the apothecary, on his part, can no more re-issue a prescription without a renewed authority from the physician originating it, than he can give professional advice in his name, or use that name in any transaction of life, then the whole question will be resolved into a simple one touching the proprietary right of physicians in their own prescriptions. And, first of all,

WHAT IS A PRESCRIPTION?

Counsel or advice, as given by a physician or lawyer, is, in the language of political economists, an immaterial product, which is consumed in its very production. Whether reduced to writing or not, it is the property of its author, and its *usufruct* may be sold to any one, though the right of property in the thing itself is not thereby dissevered from its original author. Now a prescription is professional advice in the nature of an order for the compounding of certain drugs intended to be used under specific conditions, and those only, viz.—*First, as to time; second, as to individuals.* And in order to guarantee the good faith of

the prescriber, *it should bear his name.* The specific conditions above recited form an implied contract between the physician and patient, consisting of two elements: first, that the prescription exhibits ordinary skill in its composition; and, second, that it is, according to the best judgment of the physician, suited to the necessities of a particular patient at a particular time. The unities of skill, present or contingent pathological necessity, coupled to individual wants, must all reveal themselves in the prescription. For, unless without a date, or without a patient's name, no prescription implies universality of use, or illimitability of time. Again, as the physician's reputation is involved as much in his prescriptions as in his treatment, of which they, in fact, form a part; and in case of a suit for malpractice, his ordinary skill will be tested no less by the one than the other, it is important that he should sign his prescriptions, since it is only in this way that their paternity can be verified. A patient has a right to refuse receiving a prescription from a physician who will not sign it; nor should an apothecary be allowed to compound an anonymous one. The refusal to sign, of itself, casts suspicion upon its merits, and practitioners should bear in mind that a man's reputation for judgment and self-reliance, as well as skill, may turn on precisely such trivialities as these. In reality, however, these are not trivialities, for they constitute safe-guards precisely as no one would accept a check unsigned, nor would the teller of a bank pay one, even though the drawer presented it himself. It is here that physicians too often neglect the first duty which they owe to themselves when prescribing, viz., that of investing the prescription with a character of scientific accuracy commensurate with their own, and a legal precision indicative of the responsibility they assume in issuing it. In the majority of instances, as all will testify, no signature is appended to a prescription, for let it be remembered that initials do not constitute a legal signature. Here is the first and fatal omission. Next, a date is rarely appended to a prescription, although no one would pretend that any prescription, however good to-day, is applicable to all time or circumstances, irrespective of a renewal by the physician after investigation of the patient's condition. And, lastly, the patient's name is not usually stated in it, thus omitting the most important evidence of its having been issued in favor of a particular person. Let any one who doubts this universal omission of self-protection on the part of physicians, step into any one of our large druggists and examine their prescription book, and he will acknowledge that we have not overstated the facts. Under these circumstances, therefore, and since prescriptions are so often signed by initials alone, which are equivalent to no signature; without date, which limits them to no time; and without name of person, which restricts them to no individual in particular, why blame a druggist for renewing a prescription, or even originally compounding it, since he may never have seen the prescription before, and cannot be presumed to know that it had previously been compounded? Why blame him exclusively?

The perfunctory way in which too many physicians write their prescriptions, is the fertile source of the evil so greatly complained of; and whenever, with a better and more realizing sense of the responsibility attached to the art of prescribing, practitioners shall ennoble their orders upon druggists, by giving them at least as much legal accuracy as belongs to an order upon a grocer, the opportunity and the disposition to renew prescriptions without authority by druggists, will both disappear.

In order to promote such a reform, let our stationers publish for the use of physicians blank-books like check-books, printed in some such form as this:

Prescription No —— For Mr. —— —— Dated.... ....186 . Renewed..... do ..... do	Prescription No. —— N. Y..... . ..... 186 . For Mr. —— —— R,..... ....R. Galen, M. D. Renewable.....186 . do .....186 . do .....186 .

RELATIONS OF APOTHECARIES TO PHYSICIANS.

An apothecary is simply a vender of drugs, whether he compounds them personally or not; and at law he stands upon the same footing as any retailer of goods, except where, on account of the peculiar character of his commodities, and their relations to human life or the public health, special statutes restrict him in the manner of their sale. As to a prescription, it is plain at the outset, that the apothecary cannot retain it without the patient's permission, though he may copy it, if he please, as a voucher of the articles dispensed by him in obedience to its term; otherwise, and in cases of error in compounding prescriptions, it would be difficult to trace the delinquent. The apothecary being responsible for want of skill in his art, as well as the physician, should exercise equal caution in compounding, as the latter is required to do in prescribing, drugs. Hence it is not only proper, but his duty also, to keep a copy of every prescription, with date and names of physician and patient. Or, if he will not do this, then some law should be passed requiring apothecaries to keep a cancelling stamp to be struck upon every prescription compounded by them, under a penalty for each omission. This stamp, like those used in post-offices, might be of any form (or writing might be used alone), and contain name of apothecary and date of compounding; and without mutilating or defacing a prescription, would thus simply record upon it two important facts in its history. The same law should contain a second clause, forbidding any apothecary to renew a prescription once cancelled, without a fresh signature from the physician originally issuing it. Now, if the physician thinks the patient may need the same prescription a second time, let him fill out the blank space headed "renewable"—with either the words "at pleasure of Mr. ——, and upon his order," thus throwing the future responsibility for its use upon the patient, or limit the renewal to some particular date, as in the first issue. But where, as is now so commonly the case, the physician neither signs his name, nor affixes any date or the name of any patient to his prescription, there seems to be no valid reason why the apothecary should not renew it just as often as it is called for. Like a bank bill thrown into the street, it is good in any one's hands who picks it up. If the physician's name be not attached to it, it is not his property, for he can claim no exclusive property in drugs, as drugs, but only in the formula which he has designed for a particular occasion. And if he does not patent it, as no respectable physician will, and as no respectable government should permit, then he cannot legally prevent any one from using it, who simply uses the prescription *without his name.* Dr. Squibb, for example, can undoubtedly enjoin any one from manufacturing and selling his Diarrhœa Mixture under his name *without permission*, for his name is his *trade-mark;* but he cannot prevent any pharmaceutical pirate from manufacturing and selling it, under the name of Smith's Intestinal Anodyne, or Great Sympathetic Restorer

And if Dr. Dover, or Dr. James, or Dr. Lugol, had chosen to manufacture the celebrated compounds which bear their names, no one could have sold them under their names without permission, though any one could use their formulæ, wherever unpatented, under any other name—since there can be no exclusive property in that which has once become the common possession of mankind; and this principle may be predicated in relation to nearly the whole pharmacopœia. With such a statute in existence as has been foreshadowed, no apothecary could renew, without authority, any physician's prescription; for, if he did, he would incur the penalty specially affixed to such misconduct. On the other hand, I am aware that many physicians would look upon the prescription book as an unnecessary piece of formalism, and like the ceremonial law, calculated to increase rather than diminish professional cares; but if they would consider it in its proper light of a legal guarantee of their professional competency, able to be of immense advantage to them as evidence, in some moment of supreme necessity, they would no longer hesitate as to its acceptance, nor have occasion to complain that some remedy was not within their reach.

In conclusion, and to add some legal artillery to this army of suggestions, I would recommend that our State Medical Society request of the next Legislature the passage of some such act as the following, viz:

Be it enacted, etc., etc.:

1. No apothecary, druggist, or retailer of medicines, shall compound any written prescription, unless it be signed with the full name and address of the person writing the same, under a penalty of —— dollars, for each and every violation of this prohibition.

2. Every apothecary, druggist, or retailer of medicines, who shall compound any written prescription, shall, immediately thereafter, and on the same day, write or stamp on said prescription, in legible characters, the date of such compounding, together with his own name and place of business, under a penalty of —— dollars for each and every omission so to do.

3. Any apothecary, druggist, or retailer of medicines, who shall compound a written prescription, bearing upon its face the certificate of an apothecary showing the same to have been already compounded, and without a renewal of said prescription by the person originally writing the same, duly expressed by a fresh signature and date, shall be chargeable with a misdemeanor, and on conviction thereof, shall be subject to a fine of fifty dollars for each and every offence so committed.

4. All fines and penalties incurred under this act may be recovered in a Justice's Court, one-half to go to the informer, and one-half to the Overseers of the Poor of the county in which such conviction shall be had.

I am, very respectfully, yours, JOHN ORDRONAUX.

ROSLYN, N. Y., July 23, 1868.

ETHER MONUMENT.—The late Thomas Lee, of Boston, wishing to commemorate the discovery of the anæsthetic use of Ether in Boston, during his life conceived the idea of erecting a granite monument for that purpose. On the 28th of July, Dr. Henry J. Bigelow formally presented the completed structure to the Mayor of Boston in a set speech, which is printed in full in the *Boston Medical and Surgical Journal* for July 2d. "The monument is of white Concord granite, 30 feet high, and arises from a square basin. Its base is cubical, leaving on each vertical face a niche containing a spouting lion's head with sculptured water lilies and

other aquatic plants. Upon this base or plinth rests a surbase adorned with mouldings, from which arises a die bearing upon each of its four sides an inscription surmounted by a bas relief in marble. These are sunk in the tympana of four pointed and cuspidated arches, supported each by two stunted shafts of Gloucester red granite, the capitals of which are enriched by poppies and oak leaves, which decoration is carried around the monument on the same level in a band or string course." From this point the structure diminishes rapidly in diameter by a series of mouldings to a base, from which arises a shaft of polished red granite with a decorated capital, the sculpture of which is intended to symbolize the relief of suffering. The first inscription is as follows:

"To commemorate the discovery that the inhalation of Ether causes insensibility to pain. First proved to the world at the Mass. General Hospital, in Boston, October, A. D. MDCCCXLVI."

Two of the inscriptions are scriptural, and the fourth states that the monument was erected by a citizen of Boston in gratitude for the relief of human suffering by the inhaling of Ether. No reference is made to the individuals who have been before the public with the claims of discoverers. Death has just removed the most zealous of these, Dr. Morton (see page 480), and when time has developed the true verdict, we doubt not that justice will be rendered where it is due.

New Filtering Apparatus.—Messrs. Hance, Griffith & Co., of Philadelphia, have sent us a new arrangement made of glass, which they call "a non-wasting percolating and filtering apparatus." E. H. Hance, the designer, says it is intended to prevent the wasteful and injurious exposure which too frequently occurs in conducting the processes referred to in its title. The arrangement consists of an outer, cylindrical, glass vessel or reservoir, furnished with a faucet below, and having the rim expanded so as to form a shoulder within, above which the rim rises about an inch. This rim is ground perfectly flat on top so as to form an air-tight joint with the lid or cover, which has a flat surface to fit it, but unfortunately no flange to prevent it from slipping off. When used for percolation there is a second cylinder of glass with a projecting rim to rest on the shoulder of the reservoir. The lower end has a beaded edge, so that a piece of cloth or filtering tissue may be tied securely over it as a diaphragm. When used for filtering, the funnel is supported by its upper edge resting on the shoulder of the reservoir; in either case the filtered liquid is caught in the reservoir and may be drawn off from time to time by the faucet. The whole is so simple in its action that it needs no explanation, it being merely the suspension of a filter in a close vessel. There are two points in connection with it that suggest a criticism, viz: The easily displaced cover, the loss or fracture of which destroys the usefulness of the whole apparatus; and the metallic faucet. The former may be replaced by a piece of plate glass, and the latter by a gum elastic tube with a compress stop—or, if expense is no object,

a glass faucet in cases where the metal is objectionable, or a cork may be substituted for both. (See wood-cut in advertisement sheet.)

British Pharmaceutical Conference.—The official call of the fifth annual meeting of this body, to convene at Norwich, under the Presidency of Daniel Hanbury, F. R. S., will have taken place before this number is issued. Its results will probably reach us in time for our next, and will be awaited with interest.

The Pharmacist, a quarterly journal proposed to be issued by the Chicago College of Pharmacy. Our Chicago brethren appear to be in good earnest, and have issued a prospectus soliciting advertisements, to which they look for support to their journal during its infancy. The editorial services to be gratuitous. The publishing committee consists of E. H. Sargent, Thos. Whitfield, Henry Biroth, John W. Ehrman, James W. Mill, Albert E. Ebert and N. Gray Bartlett. The first number will be issued on the first of September, 1868, and will be sent to every druggist in the north-western States. There is no reason why this enterprise should not be successful, unless it be apathy on the part of those who should support it. There are enough able pharmaceutists in Chicago to carry it forward, and it may be the means of eliciting some valuable brain work from many who are indisposed to contribute to distant journals. Presuming that the committee intend to conduct the work in accordance with good ethics, they have our cordial wishes for their success.

Half-yearly Compendium of Medical Science, Part 2d, 1868. A synopsis of the American and foreign literature of Medicine, Surgery, and the Collateral Sciences for six months. Edited by S. W. Butler, M. D., and D. G. Brinton, M. D. Part 2d, July, 1868. Philadelphia, S. W. Butler, M. D., 115 South 7th st.: pp. 351, octavo.

This work, received just as we are printing our last form, is an enterprize commencing with the present year, and of which this is the second number. It appears to be well selected and condensed. It contains about 420 separate articles, of which 191 were by American authors and 212 of foreign writers. As the Compendium is an original compilation, and includes a much larger proportion of American papers than those similar works which are reprinted from foreign editions, it claims to deserve the support of the medical profession. It is well printed and is priced at three dollars per annum.

Announcement of the Annual Courses of Instruction in the Philadelphia College of Pharmacy, 1868–9, with terms and conditions of graduation. Philadelphia, 1868.

The reception of this pamphlet reminds us of the approaching season of study which will be opened in the new Hall in October next, under the auspices of the College Professors, Bridges, Parrish, and Maisch. It is not

expected that the practical laboratory can be organized this season, but it will be urged on to as early a period as possible consistent with its proper arrangement. The details of this branch of instruction, as it is proposed to carry it on, are too important to be hastily established.

The family Adviser and Guide to the Medicine Chest. A concise handbook of domestic medicine. By Dr. Henry Hartshorne. Philadelphia, John Wyeth & Brother, 1412 Walnut street, 1868; pp. 104, 12 mo.

An examination of this little volume leads us to view it as one of the best companions to the medicine chest that has been published, and has the great merit of giving much information in a few words. The plan of the book is simple. It begins, in part I, by answering the question for what purposes medicines are employed—as to relieve pain, to give sleep, to reduce fever, to quiet cough, &c.—and enumerates some of the important diseases, accidents or poisoning, etc. Part II replies to the query "what is the matter," in a few general directions regarding symptoms. Part III succinctly notices the principal medicines proper for popular use. Part IV is a chapter on dietetics, and part V the management of the sick room. As the book is written by a judicious practicing physician, it is free from many objectionable features that are sometimes found in works on "Domestic Medicine." The volume is convenient in size for the traveller, and is neatly printed and well bound.

Dental Materia Medica, compiled by James W. White, Philadelphia. Published by Samuel S. White, 1868; pp. 108, 24 mo.

This neatly gotten-up little volume is intended to give information in relation to the medicines and agents used and prescribed by dentists. The writer expressly avoids entering upon the botanical and chemical history of his subjects, and confines himself to the purposes and methods of using, and does not give many formulæ for manufacturing preparations as in pharmaceutical works. One-fifth of the pages relate to anæsthetics, general and local, but caution the readers in relation to their too frequent use. By permission of the publishers we have copied the article on Nitrous Oxide, at page 408, to which the reader is referred.

Thèse de Pharmacie présentée et soutenue a l'école supérieure de Pharmacie, par Armand Fumouze, Docteur en Médicine. Pharmacien de 1re Classe. *De la Cantharide Officinale.* Paris chez Germer Bailliere, 1867: pp. 58, quarto, with four engraved plates.

From E. Fougera, New York. This work on cantharides appears to be very thorough and complete in all its parts, as regards the commercial, natural, and chemical history of the cantharis, and the insects which attack it. We have before published his method of isolating cantharidin by the consecutive action of chloroform on sulphuret of carbon (see page 116 of volume), and in a future number will give a further notice, which the lateness of its reception prevents us from giving now.

Materia Medica. By John B. Biddle, M.D., Prof. Mat. Med. in Jefferson Medical College, &c. Third Edition, enlarged. Phila., Lindsay and Blakiston, 1868, pp. 384, octavo.

Students who are engaged in the arduous task of following the numerous studies embraced in our first medical schools, especially when aiming at the diploma after a second term, desire to have the subjects presented to them in a form favorable to easy grasping, by avoiding many details found in the large treatises. Dr. Biddle's work comes under this category and forms the text-book of his class. The nomenclature is strictly that of the Pharmacopœia, which is constantly recognized and referred to in the course of the work. In this edition a number of new remedies and methods are introduced and the work brought up to the present time. Particular attention has been given to the doses and therapeutic uses, and our indigenous remedies quite numerously noticed. The book, very well printed on good paper and substantially bound in muslin with thick cover, is highly creditable to the publishers. Price four dollars.

Lessons in Elementary Chemistry, inorganic and organic, by Henry E. Roscoe, B. A., F.R.S., Prof. of Chem., in Owens College, Manchester. New York, W. Wood & Co., publishers, 61 Walker street; 1868, pp. 383, 12 mo.

This is a reprint, without additions, of Prof. Roscoe's work. The author has "endeavored to arrange the most important facts and principles of modern chemistry in a plain but precise and scientific form, suited to the present requirements of elementary instruction." The new views in reference to nomenclature and symbols have been adopted, and the ultra modern forms of expression used. The next remarkable fact in connection with the book is the adoption of the metrical system of weights and measures, and the centigrade scale for temperature, and hence it is one of the pioneer instances of the adoption of this system to the exclusion of English Weights and Fahrenheit's scale. A series of questions are appended which adapts the book to college classes. The book is gotten up in English style, and appears to have been carefully printed. We have had no opportunity to compare it with the original edition. Price $1.50.

Report of the Board of Managers of the Pennsylvania Hospital to the Contributors at their annual meeting, held 5th mo., 4th, 1868, together with the accounts of the Treasurer and Stewards. Philadelphia, pp. 49, octavo.

This report is full of interest to the public. The Pennsylvania Hospital is a great and useful charity, valued by our citizens and appreciated by many at a distance who have learned of its Good-Samaritan influence in the gratuitous relief of suffering by accident in a wide circle around its location. Many citizens have given liberally to the general fund; among these the Managers especially mention Asa Whitney & Sons' con-

tribution of $10,000. The medical corps of the hospital are greatly in need of a new lecture and operating room for the use of the Surgeons, and subscriptions are now being received to forward the work which has been commenced. 1787 patients were treated the past year, of whom 740 were natives and the remainder of foreign birth. The whole number of patients of all kinds from the foundation of the Hospital is 86,428.

Half-yearly abstract of the Medical Sciences; being a digest of British and Continental Medicine, and of the progress of medicine and the collateral sciences. Vol. xlvii. Jan.—July, 1868, pp. 291. Philadelphia, Henry C. Lea.

Braithwaite's Retrospect of Practical Medicine and Surgery; part lvii, July American edition. W. A. Townsend and Adams, 434 Browne street, New Yoak.

We acknowledge the reception of these valuable semi-annual visitors from the publishers, and find them full of useful and interesting matters gleaned from the Journals and transactions of Societies and arranged in order for ready use, with index. Each $2.50 a year in advance, or $1.50 for each part.

Uniform Trade-list Circular.—Devoted to the interests of publishers, booksellers, news dealers, stationers, &c. Published by Howard Challen, 1308 Chestnut Street, Philadelphia. Nos. 9 and 10, vol. 2. From the publisher.

The Monthly Medical Reprint.—A reproduction of the most valuable articles published in the latest issues of the principal British Medical Journals. Five dollars per annum; royal octavo. double column, 64 pages per number. New York, John Hillyer, 14 South William st.

OBITUARY.

Prof. John Millington, an eminent chemist and practical miner, died at Richmond, Va., on the 10th instant, aged eighty-nine. He was a native of London, and an associate of McAdam, whose name is immortalized by his process of macadamizing. He formerly was occupied at the Royal Institution during the period of Sir Humphrey Davy's administration. Mr. Millington lived in Mexico several years, and engaged in the mining business. Subsequently he became Professor of Chemistry in old William and Mary College, in Virginia, and filled that chair with great acceptance for twelve years. Afterward he became Professor of Chemistry and Geology in the University of Mississippi. At a ripe old age he retired to private life, and for several years he resided in Philadelphia.

Prof. Matteucci died on the 28th of June. at Florence, Italy, after a short illness. We learn from the Chemical News, that "the deceased was an Italian Senator and Minister of Public Instruction, in which capacity he was very active in promoting the extension of Education. He was better known as a man of science than as politician or a minister. He received in 1844, for his investigations in Electro-Physiology, the prizes of the French Academy and the Copley medal of the Royal Society. He was the author of various published works on electrical subjects.

Prof. Charles G. Page died on the 5th of May at Washington, of a lingering illness. He was connected with the Patent Office as Examiner of Patents for Philosophical instruments, involving mathematical and scientific knowledge, and was himself the author of many important discoveries in electro-magnetism, among which was an electro-magnetic locomotive, which, however, was never perfected.

Nathaniel Bagshaw Ward, F.R.S., and author of the so-called "Wardian cases," died on the fourth of June, at London, aged 77. Mr. Ward was born at Plaistow, in Essex, where his father was a medical practitioner, and where he pursued the study of botany whilst an assistant in his father's office, under circumstances reflecting great credit on his energy and perseverance. The discovery of the close glass cases, which have chiefly been the cause of his reputation in botany, was made while practicing medicine in London, and the great value to science and horticulture of this method of transporting plants from tropical countries is justly estimated by the world. The editors of the Pharmaceutical Journal state that he resided at "Clapham Rise," where his garden, rich in exotics, was open to rich and poor to visit, and nothing delighted him more than to expatiate on the properties and history of his pets. Mr. Ward was an old member of the Apothecaries Company, and lately its Treasurer, and he was also a friend to the Pharmaceutical Society. For a more extended notice of Mr. Ward, the reader is referred to the Pharmaceutical Journal for July.

William T. G. Morton.—On July 15, Dr. William T. G. Morton, of Boston, died suddenly in New York city. He was at the time driving out to Central Park, with his wife. As he was passing Luff's Hotel, he fell forward in the carriage without any premonition. His wife screamed, and several persons who were near, among whom were Dr. Swan and several other physicians, and officer Thompson of the Twelfth Precinct, hastened to the spot, and found Dr. Morton in a dying condition. It was first supposed to be the effects of the heat, but the physicians soon announced it a case of apoplexy, and advised his speedy removal to St. Luke's Hospital. The deceased achieved considerable reputation in the medical world, while living, by claiming to be the first to introduce ether as an anæsthetic in the amputation of limbs and other surgical operations. He had been ill for some time, and recently arrived in New York, from Boston, with his wife.—*Med. and Surg. Reporter, Aug.* 1.